

# THE Soybean Digest

REG. U. S. PAT. OFF.  
HUDSON, IOWA

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JANUARY, 1948

## EDITOR'S DESK

### Huge Market For Soybeans

The United States is now probably the largest producer of soybeans in the world. The crop lends itself admirably to mechanical production methods, works into Midwest rotations, takes a minimum of hand labor per unit of food produced, and produces a maximum of both edible oil and protein on the same acreage. No other American crop has grown in popularity as has the soybean during the last two decades. Production, during the war years, climbed to new highs. The 1948 soybean acreage goals are the largest in our history. Soybeans have so intrenched themselves that they now supply nearly 60 percent of our total protein supply, and the soybean oil production now rivals the cottonseed oil production of the nation.

Because of her large population, Europe has not been self-sufficient in fats and oils for generations. She can probably never be self-sufficient. Her former sources of supply of edible oils and proteins are non-existent. There exists in Europe, and will continue to exist there, a potential market for vast quantities of soybeans, soybean oil and soybean meal and flour. We have but to explore and cultivate those markets now to make them available to us at that time in the future when private trading is resumed and exports are opened up.

Above all else, European nations will have a problem in feeding their peoples. They must feed them as efficiently and cheaply as possible. There is no agricultural crop which can do this job of feeding as cheaply as the soybean.

As an example of the problem now confronting the peoples of Europe we quote below from a recent letter received from Hamburg, Germany, by a Department of Agriculture official.

"I think that the food situation, especially as regards the need of protein, will interest you.

"Our regular daily ration for the average person is 1,550 calories, which is very low. For a long time we had only about 800-900 calories and now about 1,400 calories daily.

"Unfortunately, it is mainly based on carbohydrates. The need of protein is very urgent. The following will give you an idea about the development of the food situation here:

	Protein gram	Fat gram	Calories
1930-37 daily average consumption	85	130	2900
1939-40 daily ration	65	55	2240
1941-42 daily ration	60	50	2030
1945 daily ration before the end of the war	41	35	1610
1947 daily ration at the beginning of this year	40	17	1400

"Protein has been declining not only in quantity but in quality as well, as the following figures show:

Daily Protein Ration per Head			
	Total gram	Protein of high value gram	Protein of in- ferior value gram
Average 1930-39	85	40	45
1940-41	64.1	26.3	37.8
1944-45	41.1	18.6	22.5
July-Oct. 1946	40.6	12.4	28.2

"The average daily total need of protein for a grown-up person has been fixed at 75 grams, half of which should be of high value. The consequence of this lack of protein is malnutrition and 'hungerodeme.'

"Cereals can never cover this deficit of protein, which is estimated to be 150,000 tons equalling about 400,000 tons of soybeans or corresponding quantities of soy products. If this urgently-needed protein has to be imported in the form of milk, egg and meat products, the cost will be about 10 to 25 times higher.

"The importation of 250,000 tons of soya could improve the daily ration of 30 million consumers by 8 grams of high value protein.

"Our agricultural production is steadily decreasing for the following reasons:

"1. Lack of good seeds, the selection of which had been stationed in eastern Germany for climatic and technical reasons. These regions are now under Polish administration and Russian occupation.

"2. Lack of commercial fertilizer.

"3. Decreased production of manure because animal stocks have been reduced because feedstuffs are lacking.

"4. Lack of agricultural machinery and the impossibility of repairing it.

"Before the war soy was only imported in form of beans, mostly from the Far East in order to produce oil and soybean oil meal for animals. Occasionally some business has been done also with the U. S. A.

"During the last summer the first shipment of soybeans from the U. S. A.—about 6,000 tons—took place. These purchases have been executed by the U. S. military government and have been distributed in form of full fat soy flour for school children, etc.

"We are very much interested in American soybeans and soy products and hope that private business will be possible in a not-too-far future. We therefore beg you—in order to prepare for such a future business—to inform us about your production and manufacturing of products and your crops."

### Storage Pays Off

Growers who stored their soybeans this past fall instead of selling them direct from the combine have been in position to profit thereby.

Bulk of the crop sold at harvest at about \$3.25 a bushel. During December the price fluctuated between \$3.75 and \$4. The Chicago cash price December 31 for No. 2 soybeans was \$4.04.

This upward market trend following the completion of 1947 harvest was a normal one. In the past, prices have averaged lowest in October and November and highest in May and June. For this reason the *Soybean Digest* has repeatedly urged a policy of storing at least part of the soybean crop on the farm. Growers who have followed that advice are getting the higher prices.



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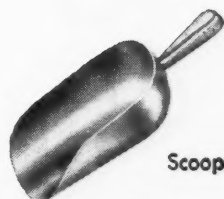
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# BATTLE OPENS FOR A FREE MARKET

The following statement was issued to the press at Washington, D. C. December 17 by Ersel Walley, president of the American Soybean Ass'n.

"Immediate removal of the federal tax on colored margarine made from domestically produced oils," was urged by Ersel Walley, Fort Wayne, Ind., president of the American Soybean Association.

Mr. Walley said it had not generally been recognized that soybeans are an important source of protein feed which is essential for the production of meat, dairy products and eggs.

"A population increase in the past 9 years, equal to the total population of Canada, has created a tremendous drain on our food resources," Walley said. "Experts expect this population increase to continue for several years, with a total increase nearing the 20-million mark. The oncoming generation of Americans is nutrition-conscious, creating a definite demand for larger quantities of meat and animal products. Continued production of efficient low-cost vegetable protein is essential to the production of the necessary meat, milk, and eggs to feed our increasing population."

"The ability of the soybean industry to produce protein meal on an efficient basis is contingent upon profitable usage of soybean oil," Walley continued. "This means that soybean oil, unhampered by outmoded restrictions, must go into food products in increasing quantities over a period of years."

Mr. Walley explained that soybean oil meal, containing over 40 percent digestible protein, today leaves the processing plant at approximately the same price per pound as is paid for wheat or corn by livestock feeders. Yet a pound of soybean oil meal will replace from 3 to 4 pounds of corn in the livestock ration, discourage the feeding of wheat, and will, therefore, help alleviate the critical grain shortage. Without a continued high production of soybean oil meal, he added, the adequate production of milk, eggs and meat will be jeopardized.

"Soybean oil is a natural golden color," Walley said, "yet that natural golden color must now be removed before the oil can be used in margarine, or that product is subject to the Federal discriminatory levy of 10c per pound. We know the American housewife wants her table spread yellow. She should be able to buy it in that form."

"Modern margarine is a clean, nutritious, widely accepted product of American farms. It is the only food product on the American market upon which specific discriminatory taxation has been levied. This discrimination should be removed as quickly as possible."

"Soybeans contribute more pounds of edible oil to the economy of the United States than any other crop, according to Bureau of Agricultural Economics figures. Out of a total estimated consumption of 3,242,318,000 pounds of vegetable oils, soybeans contributed 1,041,364,000 pounds in 1946. In the 10-year period between 1936 and 1946, soybean production in the United States increased from 33 million bushels to 196 million bushels,

a six-fold increase. In 1946 alone, soybeans contributed 600 million dollars to the farm income of the Midwest production area. In that area, soybeans are now second only to corn in importance as a grain crop.

"At the same time, soybean oil supplies during the war years made America self-sufficient in vegetable oils for food usage for the first time in decades. In view of the current uncertain world situation, many national leaders feel that the United States can never again afford to rely on outside sources for her edible fat supplies. With production of other domestic vegetable oils already at maximum levels, soybeans are the crop which most logically will be called upon to supply the added quantities of edible oil which our economy will need in the future."

**Campaign by the ASA** In cooperation with the National Cotton Council, representing the producers of cottonseed and cottonseed oil, the American Soybean Association, through its officers and board of directors, plans to make an active fight for removal of the current federal tax on colored margarine in the current session of Congress. The proposal of President Walley, carried in the news release above, would allow the 1/4 cent per pound tax on all margarine, colored and white, to remain, and would keep the administration of the law in the Bureau of Internal Revenue, where it now rests. Thus, the present machinery for administration of the law would be retained, assuring complete checks and absolute compliance.

Since 1941 the American Soybean Association has consistently gone on record as favoring the repeal of all taxes, both federal and state, on margarine made from oils produced within the United States. That policy has been retained through the war years, and becomes even more important now as we face the postwar era and the probable imports of low priced oils of tropical countries in future years.

Sponsorship for the repeal bill agreed upon by the two organizations representing farmers of the South and the Midwest is now being arranged. As the time comes for members of the American Soybean Association to make their wishes known to their Congressmen you will be asked to do so on these pages. Success or failure of the bill will depend upon the interest, actively expressed, shown by members of this association. The South has traditionally favored repeal of the margarine laws. Their representatives have now agreed upon all phases of a domestic bill as proposed by the American Soybean Association, hence progress should be greater than ever before. A major contributing factor will be the pressure being built up among consumer groups for repeal of the federal taxes.

The federal margarine taxes are unjust, outmoded, are legal restrictions designed in restraint of trade. Soybean oil and cottonseed oil are being penalized. Soybean growers must insist on a free market for their products—if the industry is to grow and prosper.



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## GROWERS

### Canadian Prairie

Soybeans as a crop are still very much in the experimental stages in most parts of the Canadian prairies, reports *Farm and Ranch Review*. Experiments conducted at the Dominion Experimental Farm, Indian Head, Sask., says J. G. Davidson, who was in charge of the experiments, show that, even where seed is produced, yields approaching those of Ontario cannot be expected. Most Canadian soybeans are produced in Ontario.

Soybean hay can be grown without difficulty, and the Mandarin and Kabott varieties have produced an average of about 1-1¼ tons of cured hay to the acre over the past 13 years.

It is in seed yields that the main interest lies. Test results at Indian Head indicate that only early maturing varieties should be tried. Kabott ripens fairly early and Manitoba Brown about 10 days earlier still. The average seed yield of Kabott over the past 4 years is around 10 bushels to the acre. Manitoba Brown has not yielded as much. It has a tendency to shatter its seed when ripe.

Soybeans will stand a lot of frost in the spring but very little in the fall. At Indian Head, Kabott has been sown at intervals of 3 days to a week from April to early June. In spite of much spring frost little damage has resulted.

### First Soybeans

New crops and new uses for the present products of agriculture are things that our long-distance planners should consider. The soybean is perhaps the most conspicuous and most valuable developed in the present century.

I remember well my first experience with it. A friend, the late Fremont Hickman of the Ohio Experiment Station, got me a bushel of soybeans for seed more than 40 years ago.

We sowed it in a field quite distant from the road but in full sight of it. In one way it proved to be a kind of a nuisance, for so

many persons who saw it at a distance stopped at the farm home to ask about it. It was made into hay, and in curing that hay developed some mould. That was the first mouldy forage I ever saw sheep eat.

This year I have raised some acres of soybeans on land that wet weather kept out of oats or corn. The hay will be fed to lambs, for experience tells us that it is good for them. In recent years we have had this hay ground and a bit of molasses mixed with it, and that is all cleaned up by the lambs being fed for market. I have not known of others doing this, but feel that I can recommend it. For it I must give credit to my farmer Robert B. Coen, who first proposed it. —E. S. Bayard in *Pennsylvania Farmer*.

### International Winners

H. L. Stiegelmeier, Normal, Ill., farmer won the title of Soybean King for the second year in succession at the International Hay and Grain Show in Chicago Nov. 29-Dec. 6.

Stiegelmeier entered Lincolns. He will hold for the second year the soybean trophy offered by the Union Stock Yard and Transit Co. of Chicago. He will own the trophy permanently if he can win it again in 1948. He also won the Philip W. Pillsbury trophy outright again this year.

The International Soybean King has been raising soybeans for 21 years. He operates three farms totaling 390 acres.

Reserve champion honors went to Wm. R. Beattie, Staples, Ont., Canada. He exhibited the A. K. variety.

First place winners on soybean exhibits at the show, which was held in conjunction with the International Livestock Show, include:

Regions 1 and 2, Beattie; Regions 3 and 7, W. T. Schwenk & Sons, Edwards, Ill., with Hawkeye; Regions 4 and 8, Stiegelmeier; Regions 5 and 6, McGuire Bros., Wood River, Nebr., with Lincoln.

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## On Sour Soils

Soybeans came in as a "new" legume crop. They were reported to "grow on acid soils," says Wm. A. Albrecht of the University of Missouri in *Hoard's Dairyman*. But on such soils they were also reported to be "a hay crop and not a seed crop." We did not realize that they were not building proteins and other complexes demanding soil fertility to make a seed crop and that consequently they could not be a nutritious hay in these respects. Soybeans need lime, too, if they are to give good feed. They are showing growth troubles when the soils are not well supplied with magnesium. They are also reporting the need for manganese on some soils. Soybeans can be grown on an acid soil that is fertile in more respects than in calcium only.

We need no longer hunt for "acid-tolerant" legumes. Any plant that is well nourished tolerates acidity, says Dr. Albrecht, who insists that legumes fail not because of a soil is sour but because the fertility has leached away.

## Watch Moisture

Late-harvested soybeans may have a dangerously high moisture content in some sections, E. S. Dyas, Iowa State College extension agronomist, warns. This is most likely

to be true in southeastern Iowa.

Damp weather, followed by early snow, resulted in some immature beans being harvested and binned before being thoroughly dried. In such cases, the beans should have been spread out thinly when harvested. If there was much dirt and chaff in them, it should have been fanned out, Dyas said.

Farmers who were forced to put damp beans into bins should continue to check moisture content and turn the beans frequently. Forced warm air may also be used to dry them, but care should be taken not to dry them too fast. It may cut down test weight and lower the grade, Dyas warns.

## Yelnando Soybean

Coker's Yelnando soybean was introduced as breeders' foundation stock in North and South Carolina, Georgia and Alabama in 1947, reports Robert H. Garrison, in charge of seed certification at Clemson, S. C.

Yelnando was bred as a chance cross of Coker's Yelredo (Mammoth Yellow x Laredo) and Nanda, and was developed by Coker's Pedigreed Seed Co., Hartsville, S. C.

The variety is highly shatter resistant, well suited for combine harvesting, and makes an erect semi-viney growth. However, it is not reported to be as high a seed producer as certain other varieties nor does it produce as much hay as some.

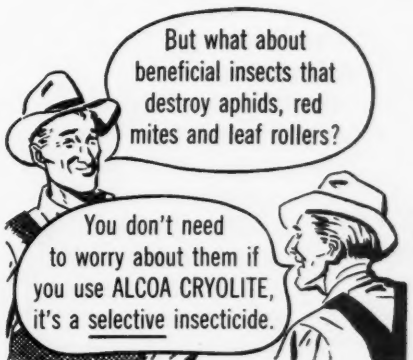
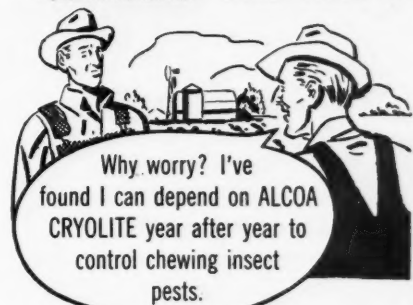
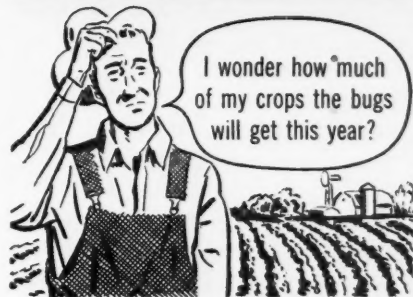
J. W. Talbert (left) of the sales department and R. S. Cathcart, farm manager, for Coker's Pedigreed Seed Co., examine a block of Yelnando soybeans.



JANUARY, 1948

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## LETTERS TO THE EDITOR

### Combine Difficulties

To the Editor:

Here in the Yazoo-Mississippi Delta, in rainy falls we have considerable difficulty with combines. Soil is usually sandy to clay loam, sometimes a "semi-buckshot" black land, and the usual 6.50-16 or 7.00-16 tire on combine will sink so deep in soft ground that it will be impossible to operate. This condition existed for about half the harvesting season here this year, and caused considerable loss.

One manufacturer lists dual wheels "for soft conditions," and also lists a much larger wheel, 7.50-24 for the same condition.

An inquiry as to which would probably be better, the 16-inch duals or the 24-inch single, got only a short reply that this equipment was not handled in the Memphis branch—the man who answered didn't even mention the main question.

I wonder if any of the staff have had any experience with the different kinds of wheels, or would know anyone to contact who could give the information. —W. C. Sharbrough, Holly Bluff, Miss.

### Iowa Report

To the Editor:

Farmers in this locality had a pleasant and also a profitable surprise in the soybeans they planted about July 8. They expected only a hay crop, but the fall season here was so late without killing frosts, that the beans matured and are of good quality and

run 20 to 22 bushels per acre. The farmers are getting about \$3.50 a bushel for them.

Belle Plaine is located at the junction of Salt Creek valley with the Iowa River valley.

The level, fertile bottom lands are extra good for soybeans and yield up to double those of the higher lands. Also, the bottom soils do not wash like rolling lands.

Benton County, Iowa, is the leading county of the world in hybrid seed corn production. There is a large plant at Belle Plaine.

But there is no soybean mill within 40 miles. —H. Roy Mosnat, Belle Plaine, Iowa.

## AS THE PRESS SEES IT

### Nuisance Tax

One of the several tax measures which the Arkansas Public Expenditure Council cites in its recent study as unnecessary and costly is the state tax on oleomargarine made from foreign oils.

This law, enacted by the legislature in 1935, was designed to prevent the sale of margarine in Arkansas except that made from cottonseed, peanut, soybean and other locally produced oils and fats. The tax up to now has yielded exactly \$30.80 in revenue since its enactment. The joker in the law is the fact that it takes considerable costly laboratory equipment and a trained tech-

nician to determine whether a product contains any foreign oils.

Most states have restrictive taxes on margarine. In addition, there is the federal excise on this food product. An argument could be made for these protective taxes in years past, when margarine was made largely from foreign vegetable oils. But now it is made chiefly from oils and animal fats produced on American farms.

To tax one farm product in favor of another just isn't fair and right. All it does now is to make margarine dearer for millions who have a hard enough time to pay grocery bills. Butter needs no such aid. The Arkansas tax should be repealed at the first opportunity. —*Arkansas Democrat*.

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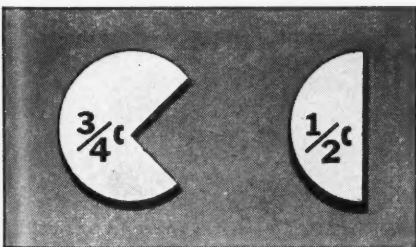
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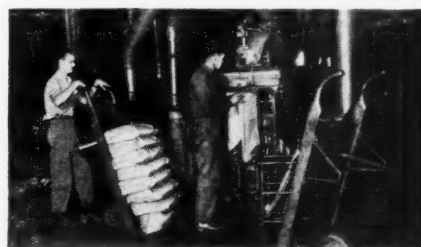
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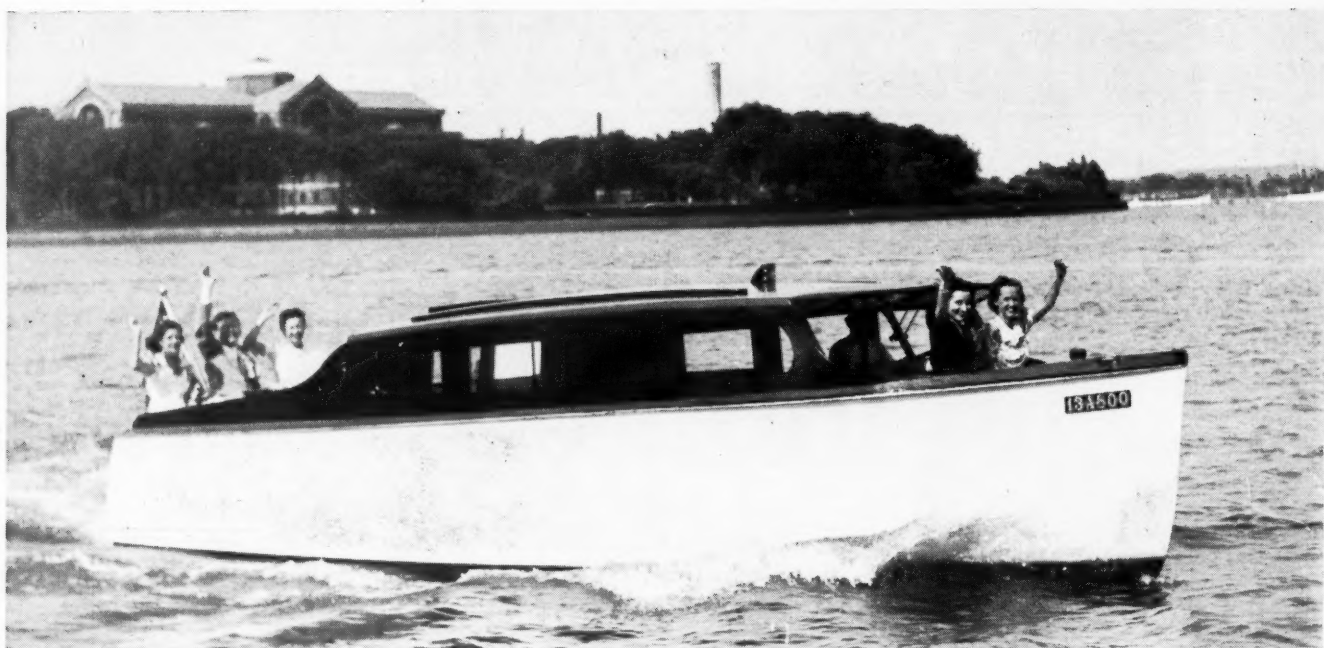
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COMPANY \_\_\_\_\_



The boat was painted with a soybean oil base paint. U. S. Department of Agriculture photo.

## SOYBEAN OIL IN PROTECTIVE *and* Decorative COATINGS

By R. L. TERRILL  
and FRANK MITCHELL

Members, Soybean Research Council

FOR MANY years refined soybean oils have been used as such in relatively small quantities in protective and decorative coatings. Up until a few years prior to World War II, however, the total use of soybean oil in protective coatings and related products was so small as to be insignificant. Tung and linseed oils were the standard drying oils used by the paint and varnish industry. Drastic shortages in both these oils were occasioned by the war, so that the development of substitutes became an urgent necessity. Unfortunately, the world-wide shortage of oils and fats and the consequent demand for soybean oil in such vital foods as shortening and margarine, caused its use in paints and varnishes to be necessarily restricted. The coatings industry used soya oil to the extent that it was permitted, however, and a vast amount of applied research was done on the technical utilization of soybean oil, particularly with regard to the improvement of the drying qualities of the oil.

Soybean oil is classified as a semi-drying oil, being intermediate in character between olive oil (a non-drying oil) on the one hand

and linseed oil (a drying oil) on the other. Soybean oil which has in no way been treated to change its chemical nature is extensively used in coatings today along lines developed during the 1930's. For example, alkali-refined soybean oils are widely used in the manufacture of oil modified alkyd resins, which can be modified with even non-drying oil to yield excellent finishes for many purposes. The use of soybean oil is particularly advantageous in this application because of the oil's non-yellowing characteristic; in this manner soybean oil is frequently a component of the gleaming white-baked finishes on modern appliances such as refrigerators, stoves and washing machines. A comparatively large quantity of all the soybean oil used in coatings goes into the preparation of alkyd resins.

### In Blends

Another manner of using chemically unmodified soybean oils is to blend them with oils of outstanding drying properties, such as tung oil, and to use this mixture to extend or replace linseed oil. This is the oldest method of soybean oil usage in paints and varnishes, and it is of importance at present because of the availability and the relatively low price of tung oil. Soybean oil has also been processed in the past in the conventional mode of treating industrial oils to prepare, for example, such products as oxid-

ized or "blown" oils. This type of oil is generally plasticizing in nature and is used in oilcloth and in similar products as well as in caulking compounds of various specifications.

However, one of the most important results of applied research on soybean oil has been the development of soybean oils of improved drying properties with characteristics approaching, and in some instances surpassing, those of linseed oil. The soybean drying oils vary in character, of course, according to the nature of the treatment by which they are modified. Without pursuing the technical phase of this development, suffice it to say that the attack has been generally two-fold; first, by segregation of the drying and non-drying constituents and second, by various chemical modifications of the oil, all of which impart characteristics not possessed by the original oil.

The improved soybean drying oils are usually made from alkali-refined soybean oil, but sometimes are based on the fatty acids derived from the oil. Generally speaking, they polymerize or "body" in the varnish kettle much as do the linseed varnish oils. Thus they are finding extensive application in varnishes and enamel vehicles. Such oils are also used without further heat treatment in the formulation of outside house paints. As a matter of fact, outside house paint has



been formulated from 100 percent improved soybean oil vehicles and has been found to show excellent weathering characteristics, very comparable to those obtained when using pure linseed oil vehicles. It should not be concluded, however, that soybean drying oils could completely substitute for or replace linseed oil, as it is generally agreed that such is not the case. While they excel in certain qualities, they necessarily differ in others; therefore, it is the general practice to replace a part (say up to about 50 percent) of the linseed oil in outside house paints. Another factor is that imparting drying qualities to soybean oil involves some cost for materials and processing, thus reducing the economic advantage that may exist due to the generally higher cost of linseed oil.

### Non-Drying Oil

Applied research has also found an additional use in coatings for soybean oil by working to a precisely opposite end: that of creating from it a perfect non-drying oil. This has been accomplished by the discovery of processes which make possible the incorporation of hydroxyl groups into the soy-

bean oil molecule. Soybean oil which has been so treated becomes somewhat similar to castor oil; the treated oil is soluble in alcohol, as is castor oil and no other oil. This product is used as a substitute for castor oil in coated fabrics and also as a plasticizer in different types of lacquers.

Thus we find soybean oil being extensively used in various types of protective and decorative coatings. Soybean drying oils are now being widely used, principally as extenders and substitutes for linseed oil in the manufacture of such products as paints, varnishes, enamels, linoleum, oilcloth, and printing inks. While these improved soybean drying oils probably will not completely replace other drying oils, and while by far the greatest quantity of soybean oil used in the United States today is still used in the food industry, the use of soybean oil in coatings is increasing. It seems certain that improved soybean drying oils will be produced and used in such quantities that they will be an important factor in the drying oil market. In this manner the soybean has taken an important place in still another American industry.

Contributing to the attractive appearance of this Iowa farm home is a soybean oil base paint. The farmstead belongs to Harry R. Langlas, Marengo, Iowa.



## NEW RECORD IN INDIANA YIELD CONTEST

Herman Barrett of Ft. Branch, Gibson County, Ind., captured new laurels as an outstanding Hoosier farmer by winning Indiana's 1947 soybean yield contest, announces K. E. Beeson, secretary of the Indiana Corn Growers' Association.

Barrett's championship field checked out 55.5 bushels per acre on the best 2 acres in a 30-acre field that averaged 44.3 bushels. This set an all-time high for Indiana soybean yield contests, as Barrett topped by one-half bushel the 55-bushel record set by Geo. M. Schell of Madison County in 1946.

Barrett now holds the distinction of having produced the highest officially measured

yields in both the soybean and 5-acre corn contests. His yield of 190.1 bushels of corn per acre made in the 1941 contest has never been equalled, while his corn yield of 145.9 bushels won him third place in the state 1947 contest.

As an operator of 720 acres of fertile Gibson County land, and an extensive cattle feeder, Mr. Barrett is a firm believer in excellent fertility practices. During the 4 years preceding 1947, the field in which the record-breaking soybean yield was produced, received a total of 2,250 pounds of fertilizer per acre, 5 tons of manure and 2 tons of limestone. No additional plant food was

used direct on the bean crop, but residual fertility, and excellent seedbed preparation in which weeds were given a chance to germinate and then were destroyed prepared the field for this sensational yield of soybeans.

### Championship Field

History of the field is as follows: 1943—2 tons of lime and 1,000 pounds of rock phosphate; 1944—wheat, with 250 pounds of 3-12-12; 1945—clover, with 5 tons of manure; 1946—corn, with 800 pounds of 3-12-12 and broadcast 200 pounds of 3-12-12 on disked ground. No fertilizer was drilled with corn.

This field was plowed in December 1946. It was worked eight times with a double disk and culti-mulcher (a spring-tooth harrow and culti-packer combination tool) through the spring season in order to keep weeds down. Barrett produced 36.6 bushels per acre on 100 acres of weighed soybeans.

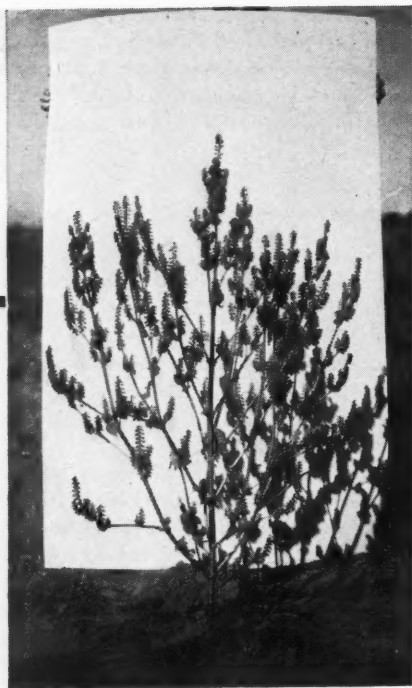
Soybeans were drilled solid with 2 bushels of Chiefs per acre June 2 and 3. The crop was combined October 23. Barrett produced 36.6 bushels per acre on 100 acres of weighed soybeans.

The Indiana champion has been raising soybeans since 1926. But he did not enter a yield contest until 1946, when he won the county championship with the Chief variety. His yield last year was 41.1 bushels per acre.

Melvin Francis of Clay County gave Barrett a close race for first place honors with a yield of 54.6 bushels; George Schell of Madison County, 1946 champion, claimed third place honors with 52.8 bushels per acre, only 2.2 bushels under his earlier record, and Clair Meyer also of Madison County won fourth place honors with 50.2 bushels per acre. All used the Lincoln variety except Barrett who due to his southern Indiana location used the Chief.

Gibson County, one of the few garden spots of Indiana in 1947, claimed the lion's share of crops contest winners as Chas. L. McCarty won the state 5-acre corn contest, and Herb Johnson won the area wheat championship in the only officially conducted contests in the state. All were honored by Governor Gates and President Hovde at the annual dinner of the Indiana Corn Growers' Association held December 31 at Purdue University.

Other high yields among the 106 contestants in the Indiana soybean contest follow: Donald Stoten, Jr., Rush County, 49.9 bushels; Leonard Metzinger, Benton County, 49.3; Raymond Francis, Clay County, 47.9; Robert McCallister, Benton County, 47.6; Carl S. Brown, Hamilton County, 46.9; Allen Anson, Huntington County, 44.8; Henry Preiser, Cass County, 44.5; C. C. Cochard, Hancock County, 43.6; Harold Haffner, Montgomery County, 42.4; B. R. Hunter, Jasper County, 42.2; Jesse and Joseph Martin, Cass County, 41.2; Harry Moser, Montgomery County, 40.9.



A plant of dwarf early perilla. Photo taken in September.

• "KNOW YOUR OILSEEDS." One in a series of articles about oilseed crops which compete with soybeans.

# Perilla

By R. O. WEIBEL and W. L. BURLISON

Associate Professor Plant Genetics, and Head Dept. of Agronomy, Univ. of Illinois

## History and Uses

**P**ERILLA is a member of the mint family and of Asiatic origin. In India, Japan, and China where it is cultivated for its seed, two species, namely *Perilla ocymoides* L. (*Perilla frutescens* (L.) Britton) and *Perilla nankinensis* decaisne are grown. The seed contains a valuable drying oil that is used extensively in the United States for the manufacture of paints, varnishes, linoleum and other allied products. The oil is used in India and China for food purposes, but in Japan it finds extensive use in lacquer mixtures, waterproofing and finishing oil papers, paper umbrellas, lanterns, and artificial leather. It is also used in the manufacture of printer's ink, paints, and varnishes. Gardner<sup>2</sup> gives a translation concerning perilla which reads in part as follows:

"The contemporary Chinese encyclopedia *Chik Yuan* published in 1928 contains the following statement concerning su-tzu: Su-tzu is sown along the borders of the fields and alongside the roads in order to prevent domestic animals from trespassing upon the fields. From the seed of su-tzu it is possible to produce oil, which burns brightly in lamps, and is good for the preparation of paints when boiled. Paints made from su-tzu oil are solid and are used to paint various household articles. This paint is particularly good for the painting of fundamental metals (gold, silver, iron and copper) and minerals (stone, tombstones, etc.) The local population seldom uses su-tzu oils for food as its main vegetable oil, but it is often used as a seasoning with different meals of Chinese food. Some Chinese farmers say that the su-tzu, when used in great quantities for food, is having a stupefying effect upon people.

"Sometimes the seeds of su-tzu are used as a fertilizer for certain crops. When used

for this purpose they are first made lifeless by means of boiling or roasting in a stove. There is a conviction that boiled seeds of su-tzu are particularly beneficial to plants during their first period of growing and that later roasted seeds are better. Therefore, boiled and roasted seeds are sometimes mixed together and are thus used, but only as a local fertilizer for melons, kutzu and some other crops."

Perilla oil used in the United States is imported. Imports for the 1937-1941 period averaged 22 million pounds annually. Approximately 75 million pounds were imported in 1935 with a valuation of over 12 million dollars (16½ cents a pound). Figures since 1941 are not available.

## Plant Characteristics

Perilla is an annual plant which attains a height of from 2 to 4 feet under Illinois conditions. It is a rather coarse growing plant which branches profusely unless thickly planted. The leaves are smooth, glassy, and depending upon the species, vary from dark green to red in color. They are similar in size and shape to those of the common catnip plant. The flowers are also similar to those of catnip, being small, white, inconspicuous and borne in a raceme 3 to 8 inches long. The seeds are small, round, and brownish with four seeds borne in each flower or seed cup.

The plant is indeterminate in flowering habit, and will have mature seed in some racemes while only flowering in others. This creates a problem in harvesting, because there is a tendency for the seeds to shatter, once ripe, and the time for harvest is that time when the greatest amount of seed is at the proper stage.

Perilla seems to thrive best in sandy loam

soils of average fertility. Ample moisture is necessary during the growing season. While the plant resists light frosts, it seems to prefer warm, damp climates where the growing season is relatively long.

## Experimental Results

The Illinois Agricultural Experiment Station has been testing perilla for 10 years. No difficulty has been encountered in the culture of perilla in experimental plantings. A well-prepared seedbed is an absolute necessity to insure uniform planting depth and subsequent emergence. Weeds are serious and must be controlled until the plants are well established. Most experimental plantings have been made with a single row drill adjusted to seed 3 to 4 pounds of seed per acre. Depth of planting varies from ½ to 1 inch, depending on the soil. Row widths used have corresponded with the row width used for corn, but is usually 40 inches. This allows cultivation with equipment used for corn. The ordinary clover drill can be used for planting by plugging up certain spouts to provide the desired row width. Planting should be done as early in the spring as a good seedbed can be prepared. Harvesting is the difficult problem in the growing of perilla. When ripe, the seed shatters badly; therefore, the plants must be harvested when the greatest number of seeds are at the proper stage. This stage is reached when the seed cups begin to turn brown but not dry. Experimental plantings are cut by hand and either shocked and covered in the field or are taken inside to dry. Threshing is done with the grain separator or on small samples by hand flailing. Large acreages would have to be cut with a binder and shocked up to dry or cure. The combine can be used, but by the time the entire plant is dry enough to harvest in this manner much of the seed has shattered.

TABLE I. Yield and Other Agronomic Data for Dwarf Early Perilla.

Location	Season	Planted	Date Flower	Harvested	Plant Hgt. In.	Yield Seed Lbs. A.	Percent Oil* Pet.
Urbana	1943	..	8-25	..	30	715	..
	1944	5-24	8-15	9-26	36	1,247	..
	1945	5-19	8-18	9-27	45	546	46.6
	1946	4-6	8-15	9-13	46	759	47.9
Dixon Springs	1943	..	..	..	16	57	..
	1944	..	..	..	24	487	..
	1945	5-26	..	10-16	30	190	..
	1946	6-10	..	11-1	36	211	..
Brownstown	1945	5-28	8-28	10-1	30	277	..
	1946	6-10	8-18	10-1	38	836	..

\*Oil determination (moisture-free basis) obtained by the Northern Regional Research Laboratory.

TABLE II. Comparison of Perilla Seed and Oil with Some Other Common Vegetable Oils\*

Oil	Seed Wt. Bu.	Percent Oil	Specific Gravity 15°C.	Iodine No.
Perilla	37-40	30-51	.93-.94	185-208
Soybean	60	18	.92	103-152
Flax	56	32-43	.93-.94	170-204
Cottonseed	32	14-21	.91-.93	103-115
Peanut	22-30	35-50	.91**	89-97
Sunflower	24-32	22-32	.92	120-136
Castor Bean	46	35-55	.96-.97	82-90

\*Data taken from "Vegetable Fats and Oils" by Jamieson.  
\*\*20°C.

TABLE III. Comparison of Perilla Oil Meal with Some Other Common Oil Meals\*

Oil-Meal or Press-Cake	Percent			Average Total Composition (Pet.)				
	Total Dry Matter	Dig. Protein	Total Dig. Nutrients	Protein	Fat	Fiber	N-Free Extract	Mineral Matter
Perilla	91.9	34.6	62.2	38.5	8.1	20.8	16.3	8.2
Soybean (all anal.)	91.7	37.7	82.2	44.3	5.7	5.6	30.3	5.7
Flax (all anal.)	91.3	30.6	78.2	35.2	6.3	8.0	36.3	5.5
Cottonseed (43% protein)	93.5	35.0	75.5	43.2	7.2	10.6	27.0	5.5
Peanut (all anal.)	93.4	38.0	82.1	42.7	8.5	8.9	27.0	6.3
Sunflower (hulled seed)	90.0	32.0	87.4	34.8	18.3	10.9	21.8	4.2

\*Data taken from Table 1 Appendix — "Feed and Feeding", by Morrison.

## Varieties

Several strains which have included foreign introductions as well as strains developed in the United States have been tried at several locations in Illinois. Most of these strains have not matured seed when planted as far north as Urbana. Under southern

Illinois conditions the varieties known as France and Green have matured seed.

In 1943 a strain of dwarf perilla seed was obtained from the U. S. Department of Agriculture. It has produced favorable yields of seed at Urbana, and is the most promising strain that has been tested. It

does not seem to shatter as badly as other strains grown, but much shattering still occurs. Yields for this strain are shown in Table I.

Yields at Urbana have been higher than at Dixon Springs or Brownstown with the exception of the 1946 season. The yield at Brownstown in 1946 was 76.5 pounds per acre more than the yield obtained at Urbana. More favorable growing conditions accounted for the increased yield. The lower yield at Urbana in 1945 can be at least partially accounted for. A week of rainy weather delayed harvesting of the plots and even though the plants were wet a good share of the time, considerable shattering of seed had occurred before harvest. The extremely low yields obtained at Dixon Springs are partially due to shattering.

It is necessary that the plants be cut at the proper stage if the maximum yield of seed is to be obtained. Varieties more resistant to shattering will have to be developed before the combine can be economically used for harvesting.

## Oil and Meal

Good seed weighs about 37 pounds per bushel, but the bushel weight varies considerably, depending on quality. The oil content of the seed varies from 30 to 51 percent with an average of about 38 percent. Seed from the plots grown at Urbana contained 46.6 percent of oil in 1945 and 47.9 percent of oil in 1946\*. Percent oil, specific gravity and iodine number of perilla oil are given for comparison with some other common vegetable oils in Table II.

The oil may be extracted from the seed with the equipment available for the extraction of linseed, soybean, and cottonseed oil. The oil is deep yellowish or greenish in color, resembling linseed oil in odor and taste.

Press-cake, or residue left after the oil has been extracted, has a high protein content and compares favorably with linseed and cottonseed cake as a stock food. Comparison of composition and digestible nutrients of perilla oil meal with some other common oil meals are given in Table III.

## In Illinois Agriculture

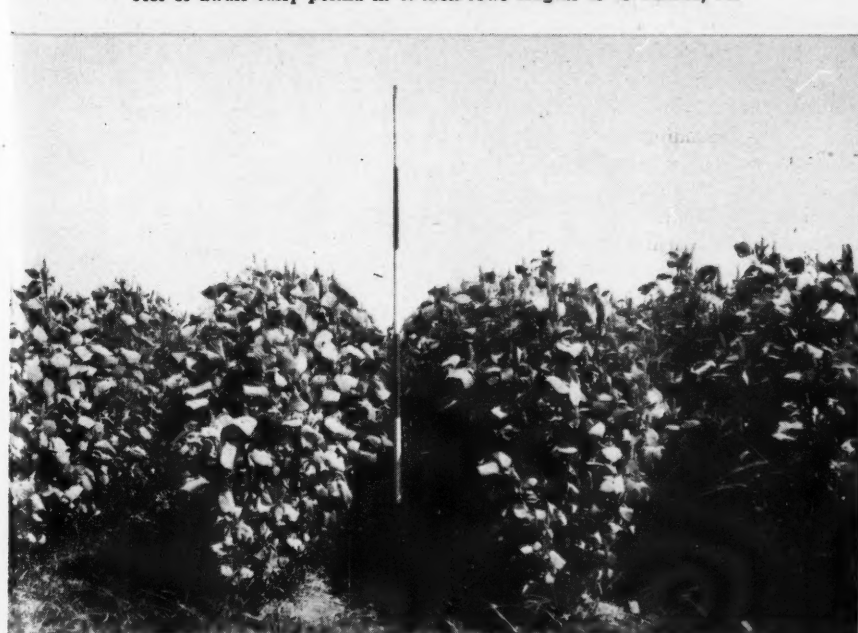
Whether perilla will become one of our agricultural crops is uncertain at the present time. It will depend upon the development of varieties more resistant to shattering, to facilitate harvesting, and some assurance of a profitable return to the grower.

\*Moisture-free basis. Oil analysis determined by the Northern Regional Research Laboratory, Peoria, Illinois.

## References

1. Fuelleman, R. F., and Burlison, W. L., Growing Perilla in Illinois. Chemurgic Digest, Vol. III, No. 2.
2. Gardner, H. A., Perilla Planting Experiments of 1936. National Paint, Varnish and Lacquer Association, Inc., Cir. 524, January, 1937.
3. The Fats and Oils Situation. Bureau of Agricultural Economics, U. S. Department of Agriculture. December, 1945.

Plot of dwarf early perilla in 40-inch rows August 15 at Urbana, Ill.





# Soy Products in the Candy Industry

*Prepared by*

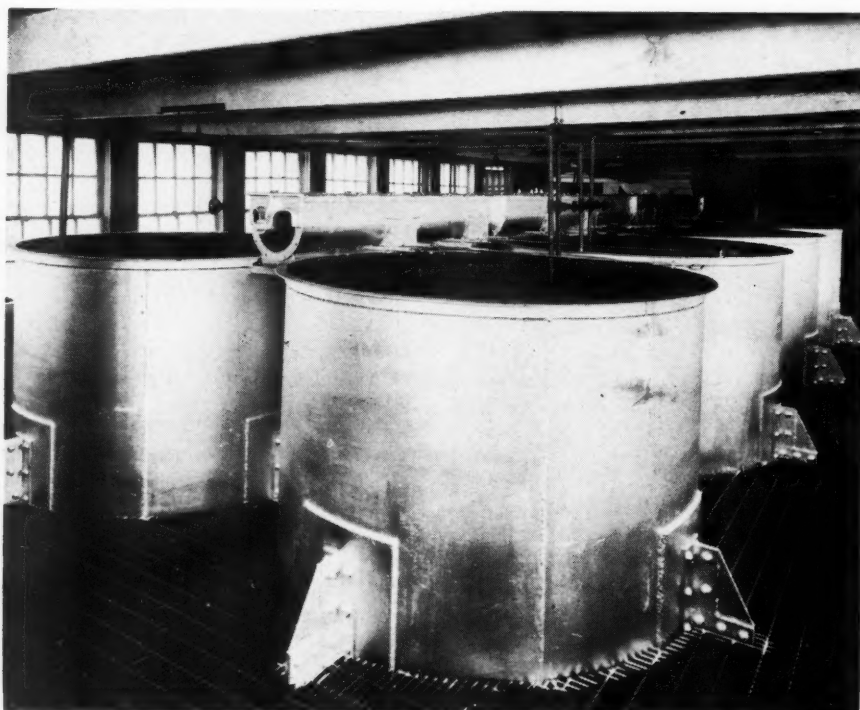
**BORDEN'S  
SOY PROCESSING CO.**

Rapidly expanding as a field for soy products is the candy industry. Confectioners turned to soy during war-time shortages. Rapid improvement in quality as a result of research has now established a strong place for soy products in the confectionery trade.

An outstanding example of such improvement and consequent firm establishment is "Soyco"—and other whipping agents now offered to the market by two or three prominent processors. Since the introduction of these whipping agents about 8 years ago, the whipping volume, stability and color of them have been vastly improved through constant research. In addition, some of them have been made practically non-hygroscopic, odorless and tasteless.

This soy albumen offers two distinct advantages to the candy manufacturer over egg albumen as a whipping agent. In the first place it is uniform. Its production from

**Top view of soaking tanks used in processing soybeans, with conveyor which delivers soybeans into tanks.**



**She seems to like these two candy bars. Both of them employ a soy whipping agent.**

bean to finished product is a series of carefully controlled physical and chemical processes. Constant tests and checks assure the uniformity of every batch. Once the manufacturer has used it he knows what the

results of every future operation will be. Egg albumen, of course, is a natural product. It is not, therefore, uniform in stability and whipping quality.

Second advantage is the price factor. Soy albumen and egg albumen prices, naturally, vary with the market price of the raw commodity. It is obvious, therefore, that in all cases the price of soy albumen will be lower than that of the natural product.

Candy manufacturers are using soy albumens in low-boiled goods as mazetta, frappes and nougat cremes. They find the stability of the product is nearly equal to that of egg albumen. Furthermore they have found that a very good chewy nougat can be made with the product. Results are a nougat that does not stick to the teeth and has a "velvety" chew that confectioners consider the top characteristic of the best type of nougat.

The manufacturers are also using soy albumen in combination with egg albumen. A 70 percent egg albumen - 30 percent soy albumen combination has worked most successfully in the manufacture of whipped cream hand rolls and light, fluffy nougats. Volume of this mixture is equal to that of

pure egg albumen with the added advantage that the product thus made will not dry out as quickly. This gives greater shelf life to the finished candy.

Confectioners report that some of the soy albumens will whip up in a syrup equally as well as egg albumen. Furthermore, some tests have shown the soy product just as stable as the egg. Where coagulation is a factor, however, it is necessary to blend the soy product with the egg albumen.

Another expanding use of soy products in the candy trade is soynuts. In Waterloo, Iowa, Borden's have installed one of the country's most modern plants for the processing of soynuts. Through carefully controlled processes they are turning out uniform dry roasted, tenderized soybeans. They are available as whole nuts, coarse or fine toppers or meal (Grind).

Soynuts have assumed particular importance in the light of the candy industry's present enrichment campaign. They contain approximately 37 percent protein. A crunch or brittle made with 40 percent soynuts will, therefore, have around 14 percent protein—a strong selling point on the grounds of enrichment.

Some candy manufacturers have turned almost entirely to soynuts in place of peanuts. In other bars, the bland flavor of the nuts makes them easily blendable with other nut meats.

Tastewise and nutritionwise soynuts are making a definite place for themselves not only in the candy industry, but in the baking trade as well. They have been used for topping, cookies, etc. Soy flour, of course, has gone into cocktail biscuits. And just

recently a leading baker in the East has incorporated soynuts in a premium loaf with great success.

These uses listed above are the beginning. Constant research and improvement of processes and quality should result in an ever-expanding use of soy products in the candy and baking trades.

— s b d —

## FOREIGN TRADE BOOKLET

*Doing Import and Export Business* is the title of a new publication issued by the foreign commerce department of the U. S. Chamber of Commerce, reports Kenneth H. Campbell, manager of the department.

The 140-page booklet should be of unusual value to trade association executives and businessmen generally interested in foreign trade. The department has made available a concise and systematic discussion of the principles, practices, techniques and problems of importing and exporting. It is intended as a practical introductory guide for use primarily by manufacturers, wholesalers and retailers without experience in importing, who wish to import foreign supplies; and by manufacturing companies or other producers who contemplate export business.

Prior to publication, the manuscript was submitted for criticism to some 50 persons prominent in importing and exporting in different capacities.

The price for the booklet is \$1 per copy, with a discount of 20 percent on orders of 25 or more copies to the same address. Order through Chamber of Commerce of the United States of America, Washington 6, D. C.

## NORTHERN REGIONAL LABORATORY EXPANDS SOYBEAN RESEARCH

An intensified and broadened soybean research program, dealing particularly with fundamental as well as technical studies on the causes of flavor deterioration in soybean oil after processing, will start shortly at the Northern Regional Research Laboratory. This has been assured by announcement in Washington by the U. S. Department of Agriculture that funds for such studies have been approved under the Research and Marketing Act of 1946. Officials at the Laboratory estimate the funds available for the current year will be approximately \$50,000.

### Flavor Stability

The importance of the problem of flavor stability in soybean oil arises from the importance of the crop in farm practice and the actual as well as potential uses for the oil in industry. As stated by E. A. Meyer, administrator of the Act, soybean production has increased twenty-two fold in the past 15 years. The crop now fills a vital need in our agricultural and total economy. Farmers have a stake in this research because the use of oil provides a market for the crop and soybean oil meal provides a large inexpensive source of high-protein animal feed. Of the oil alone, approximately 1 billion pounds is refined annually for human use and thus the problem is highly important to industry and consumers.

An indication of the trend of the broadened research the Laboratory will undertake, according to Dr. G. E. Hilbert, director, is that the most urgent problem, by far, now engaging the attention of research workers in the soybean oil industry is to improve the flavor stability of the oil. Although considerable progress has been made along these lines, the causes of flavor deterioration after processing are still unknown.

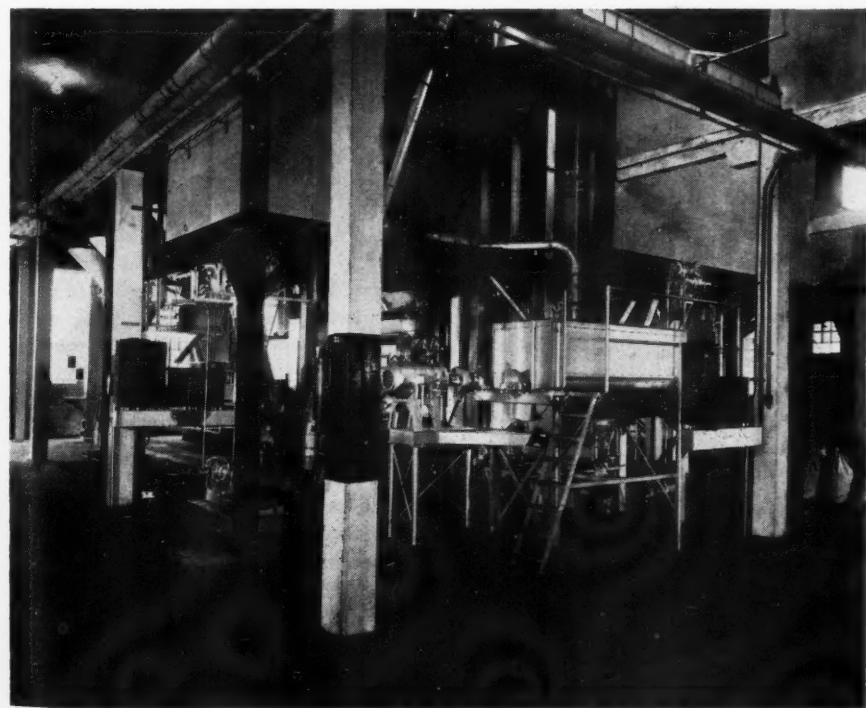
### Permanent Solution

Research workers believe that before a permanent solution can be found, new and fundamental research is required to detect, isolate, and identify the constituents of soybean oil that are responsible for objectionable flavors.

The fundamental chemistry of the development of the flavors will be sought and studies will be made on the elimination of the peculiar flavor instability of soybean oil products. Once we have a clear understanding of the cause of the flavors, superior ways and means of correcting it should be found.

This new work will be undertaken primarily by the research staffs of the Laboratory's oil and protein and engineering and development divisions which are headed by Drs. J. C. Cowan and Cecil T. Langford, respectively.

A general view of soynut processing equipment showing mixer (center) used for oiling and salting roasted soynuts.







—Photo courtesy Blytheville Courier-News

Ed Critz (left) presents trophy to Earl Wildy, Leachville, Ark., winner of first Mississippi County soybean yield contest, at dinner at Blytheville, Ark., where results were announced. Second from left is Geo. M. Strayer, editor of the *Soybean Digest*, Hudson, Iowa; and third from left is Charles L. Wylie, Blytheville, second and third place winner.

## WILDY WINNER IN ARKANSAS

Earl Wildy, Leachville planter, was first-place winner of the first north Mississippi County, Ark., soybean yield contest in 1947.

Mr. Wildy, whose winning 5 acres of Ogden soybeans averaged 40.52 bushels per acre, was presented with the first-prize money of \$100 and also the Ed Critz trophy at the first annual award banquet at Blytheville, Ark., December 11. The contest was originated by the Mississippi County Soybean Planning Committee, and was sponsored by the Blytheville Junior Chamber of Commerce.

### Presented by Critz

Appropriately, the trophy was presented by Ed Critz himself. Critz, former Mississippi county agent and now district soil conservationist at Fayetteville, is credited with pioneering the soybean crop in the county.

Charlie Wylie, Blytheville, won both the \$75 second and \$25 third prizes with plots that averaged 38.37 and 37.08 bushels per acre. Floyd Rector of Roseland received honorable mention, his plot yielding 36.55 bushels per acre.

Sixteen growers completed the contest with an average per-acre yield of 25.20 bushels. Ten of the sixteen contestants grew Ogdens. The six high yields were all from the Ogden variety. Other varieties entered were Dortchsoy No. 2 and Ralsoy.

In presenting the awards, Critz called attention to the fact that Mississippi County is unique in having 75 percent of its total area in crops. The county ranks 29th among the nation's "100 best counties in agriculture," he said.

"Every Mississippi County farmer has a duty, responsibility and opportunity to raise better crops on the God-given richness of this soil," Critz said.

A probable shrink in 1948 national acreage of soybeans due to a heavy demand for corn and other staple crops, was forecast by Geo. M. Strayer, editor of the *Soybean Digest*, Hudson, Iowa, and speaker of the evening at the banquet.

He predicted "production of fats and oils will go down instead of up at a time when they are badly needed."

Strayer also predicted:

1. Larger quantities of soybean oil will enter industrial usage. At present, he said, it is more valuable for human food, but the time is coming for greater industrial usage.

2. Soybeans will be worked into a balanced system of farming "because we will use all oil meal and oil produced for several years."

3. The soybean will play a more important part in feeding the world as the U. S. moves into the next decade.

4. One of the major factors in Mississippi County in the next 5 to 10 years will be marketing of oil and oil meal in Europe.

Using "Don't Sell the Soybean Short"

as his subject, Strayer said the government has asked for an increase in soybean production in 1948 because of the continued shortage of fats and oils. Fats and oils are so short in the U. S. that this nation will be unable to fill its commitments for shipping them abroad during the next quarter.

### Oil Shortage

Oil is not forthcoming from prewar sources such as the Far East, Strayer pointed out. The U. S. even has to ship soybeans back to China and Manchuria, from whence the first soybeans were brought to the U. S.

Urging increased soybean production for use as human food, Strayer said, "We must grow, handle and ship human food as cheaply as possible."

Keith J. Billbrey, Mississippi County agent said, "Mississippi County is at the top in soybean raising in the South." Successful soybean production has proved the possibility of diversification in Mississippi County, he said.

In addition to staging the yield contest, an aim of the soybean planning committee was to seek improvements in combines for harvesting the crop. As a result, three implement companies have sent engineers to Mississippi County to study the problem.

Billbrey said that soybean raising in Mississippi County is becoming widely known throughout the South and that many inquiries about it had reached him.

Chairman of the Mississippi County Planning Committee is George A. Hale, plant breeder of Burdette Plantations, Burdette, Ark. About 75 attended the banquet.

— s b d —

### NEW CANDY FLOUR

Announcement of a high protein, extra-fine ground soy flour under the trade name "Soyex" for the confectionery and bakery fields, is made by the soy flour department of Spencer Kellogg & Sons, Inc., Decatur, Ill.

"Candy makers, especially, have shown interest in a protein product of very fine granulation," states the firm. "When dry substances are incorporated in candy formulas, it is necessary that an extremely fine product be used to obtain the smooth texture needed in such finished products as fudge, caramels, nougats and creams. Coarse, dry ingredients often produce a granular result.

"We are now in a position to furnish an extra-fine-ground product of this character, packed in 100-lb. branded bags with paper liners, under the trade name "Soyex."

"We describe this product as 'an edible soy protein product processed from selected, dehulled soybeans of reduced fat content.'

"There is a decided advantage gained in nutritional step-up if protein Soyex is incorporated in candy. The characteristic flavors of candies are not changed by the proper addition of this product. The body and texture of certain confections are improved, shelf life is increased."



# THE SOYBEAN *Meets Democracy*

In an American Industrial Laboratory

By J. L. GABBY

Member, Soybean Research Council

**A**MERICA is a great and prosperous nation, built on a foundation of the cultures of the rest of the world. One of the great accomplishments of this nation has been the collecting, integrating and Americanizing of peoples, cultures and material things from all sections of the world. As with all great undertakings, the job is never finished. We have had our successes and our failures. It is through these that we learn and build. One of the most important things that America must remember is that each and every day of its existence it must continue to use the raw materials available, regardless of what they are, for the purpose of building a better place for everyone to live.

One good American we all know today was once the oriental soybean. This foreigner has become Americanized in a very typical way. It has learned to live and thrive on American soil. It has taken its place among the great crops of our Midwest in a comparatively short time. It has had a job to do and that job has been well done. Our livestock have been better fed because of the protein supplied by this new American. In a time of need such as we had during the last war this newcomer rose to the occasion and supplied us with tremendous quantities of much needed fats and oils. Now that the world finds itself with a very critical shortage of food supplies, the soybean is ready to step in and do its part toward making the United States the breadbasket of the world. Unlike some of our human Americans, the soybean holds no grudges or prejudices. It has a job to do, and like a real American, does it.

## Aid by Industry

During the last quarter-century it has been American industry which has brought the soybean to its position of prominence as an agricultural and industrial product in the United States. A large share in these achievements belongs to the industrial laboratories which have developed many new uses for the soybean and many new products made therefrom.

It seems almost more than coincidence that this new American with definitely foreign ancestry should meet a group of human Americans with widely varying foreign ancestry in a large industrial laboratory. Throughout the period of the second World War when the feelings and prejudices of many people ran high it was indeed in-

spiring to see this group of Americans working shoulder to shoulder under a single roof as was the case in this laboratory. To follow back the family trees of these workers one would have to go to Germany, Japan, England, Africa, Poland, Lithuania, Ireland, Scotland, Italy, Palestine and probably many more because some of the group have lost track of many of their ancestors. In this group one could easily find Catholics, Jews and Protestants working together in perfect harmony. This group is so typically what we think of as American in its democracy that it actually stands out in relief against a background of strife, ignorance and prejudice.

## All Races

It is not an uncommon sight to find a group of these people working together far into the night on some problem that proves to be difficult. At midnight the library table may be surrounded by a group including a Jew, a German, a Negro, an Italian, a Scotsman, an Englishman and a Pole all studying journals from France, Germany, England, Japan and the United States. Even in this land of democracy this might seem to a casual observer as a peculiar group to find together but upon closer observation even this casual observer would see a group of Americans working together toward a goal of science and true democracy. In this group

there is no time, or thought or significance placed upon the color of the skin, the texture of the hair, or the shape of a person's features. Here it is John, Tom, Bill or Ed, "What do you know about our problem?"

It has been through the widely varying experiences of such a group, their knowledge, hard work and pulling together that a great amount of knowledge has been gained in this field of natural products, particularly soybeans. Through the efforts of this group several new industrial products have been brought onto the market which have and will continue to increase the demand for soybeans.

From the proteins of the soybean have come industrial products which are used in the paper, paper coating and adhesive industries with a large measure of success. During the war it was found that this product developed in this laboratory could be used by others to make what was known in the Navy as "Bean Soup," a most remarkable fire-fighting foam. The developments in this field are still continuing and will lead eventually to new products in the field of foods and pharmaceuticals as well as industrial uses.

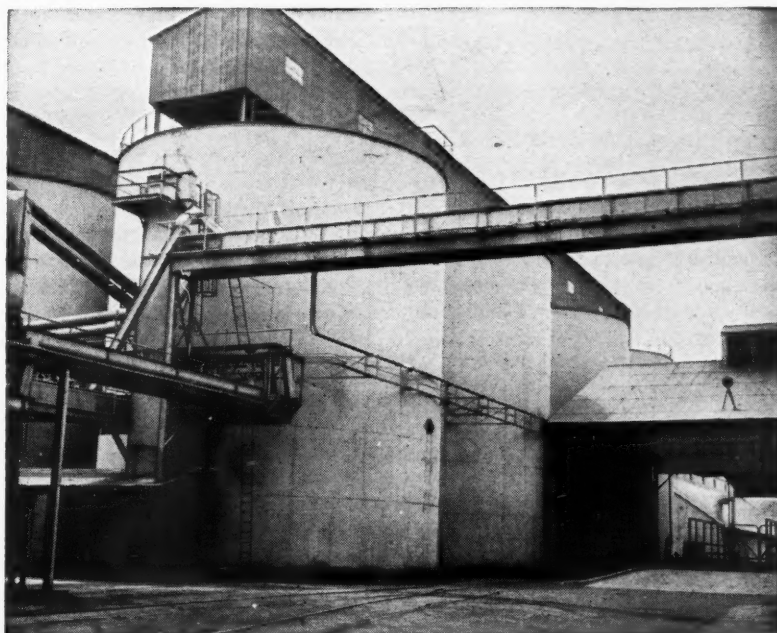
While in the past, the major use for the oil obtained from the soybean has been in

(Continued on page 31)

## Swift Mill at Cairo, Ill.

Here you see a partial view of eight soybean storage tanks at the Swift & Co. soybean mill, Cairo, Ill. Unloading shed, seen at right, accommodates several trucks and a box car at the same time.

—Illustration Courtesy Link-Belt News



## SOYA'S PLACE IN

# Feeding Your Puppy

By R. E. GRAY and  
H. E. ROBINSON

Soybean Research Council

Whether your puppy has been fed a dehydrated dog food, or a meal-type dog food, or is now being fed a canned dog food, undoubtedly soybean oil meal or soy flour has been an important factor in keeping him in good health. One of the first requirements in the care of a pet is good feeding. A well-fed dog is more likely to be a good companion, or a more efficient hunting or working dog, than is a poorly fed dog. A well-fed dog is a healthy dog, and a happy dog, requiring much less care than one in poor health and having low resistance to disease. The term well-fed implies optimum nutrition and refers to the quality of the food as well as quantity.

Optimum nutrition means that the dog is receiving all the essential nutrients (proteins, minerals, fats, vitamins, and carbohydrates), in ample amounts, in proper proportion to each other, and in easily digestible form. "Adequate" nutrition may imply the use of food just good enough to "get by" without the occurrence of a nutritional deficiency disease. The animal is to all outward appearances in good health, but does not have the excellent condition, stamina, and high resistance to disease common to the animal receiving optimum nutrition.

### Value of Protein

In order to provide optimum nutrition for your dog, the dog food you are using must be amply supplied with high quality proteins, vitamins, and minerals, as well as sufficient amounts of fat and carbohydrates to meet his caloric requirements. Manufacturers of high quality dog foods recognize the value of soybean protein and its contribution in satisfying the protein requirements of the dog. By scientifically combining meat proteins and soybean proteins with cereal proteins the dog food manufacturer is able to produce a dog food containing a well-balanced mixture of proteins.

The importance of a well-balanced mixture of proteins may be explained by reference to the fact that proteins are composed of a



—Photo courtesy National Dog Week

These Daschund puppies appreciate a good diet.

number of much simpler substances called amino acids. Proteins differ in the number and kind of amino acids which they contain. Cereal proteins differ in this respect from soy protein, and both in turn differ in comparison to animal protein. Animal proteins differ among themselves depending upon the species of animal, and the particular tissue of the animal of which they are a part. One of the functions of food is to supply the animal with proteins containing a sufficient quantity and variety of the amino acids which that particular animal requires for assembly into new tissues, or for repair of old tissues, and for the various other functions of protein in the normal upkeep and operation of the animal. The ideal protein for food purposes would contain in digestible form just the right amount of each amino acid required by the animal. Most food proteins are either lacking in one or more of the essential amino acids, or they may contain excessive amounts of certain ones. It can be seen, therefore, that by careful selection of various types of proteins, those proteins containing extra amounts of a certain amino acid may be used to compensate for those proteins which are incomplete in their amino acid content. Soybean oil meal and soy flour have been found to be valuable and economical sources of a protein which is able to compensate for the deficiencies of certain amino acids which exist in cereal proteins in general. The practical application of this information has helped to make it possible to manufacture high quality dog foods economically in large quantities.

Dogs appear to relish soybean oil meal or soy flour. The toasted flavor of most of these products seems to be particularly attractive to most dogs. Undoubtedly the presence of soy products in dog food adds to its appetite appeal for the dog.

Soybean oil meal or soy flour is used primarily for its protein content. It is necessary, therefore, that a nutritionally-balanced dog food contain other ingredients to supply the essential minerals, vitamins, fats and carbohydrates, as well as additional supplementary protein, in sufficient quantities to meet all requirements of the dog. Such a dog food may be fed with confidence that it is providing your dog with optimum nutrition.

— s b d —

### OHIO PLANT BURNS

The soybean processing plant of the Ohio Soybean Co., New Washington, Ohio, was destroyed by fire December 18, with an unofficial loss set by Levi Badertscher, plant manager, at between \$75,000 and \$100,000.

Only two walls of the 60x160 ft. brick structure remained, as 60 tons of soybean meal and 5,000 bushels of beans continued to burn hours after the building was destroyed. Fifteen large motors were destroyed, together with other equipment, including a \$20,000 machine.

The blaze was believed to have been caused by a spark from a piece of steel in a soybean grinder.



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# U. S.-WORLD SOYBEAN PRODUCTION IS DOWN

Production of soybeans in 1947 is estimated at 181 million bushels, 10 percent below the record crop of 201 million bushels produced in 1946, reports the crop reporting board of the U. S. Department of Agriculture in its annual crop summary released December 17.

The crop this year is the smallest since 1941 although it is far above prewar production. The 1936-45 average is only 118 million bushels. The crop is smaller than in 1946 because of much lower yields per acre; the acreage harvested for beans was 13 percent more than last year. The 1947 yield of 16.3 bushels per acre is the second lowest in a decade and is well below the near-record 20.5 bushels produced last year and the 10-year average of 18.2 bushels per acre.

The 12.9 million acres of soybeans planted alone for all purposes in 1947 was almost 1¼ million acres above 1946. The acreage interplanted with other crops, grown mostly in the southern states, is estimated at 1½ million acres, a slight decline from 1946 which continues the downward trend which began about 10 years ago. Of the total soybean acreage about 11.1 million acres or 81 percent was harvested for beans, the highest percentage of record. Last year 9.8 million acres were harvested for beans from a total of 12.4 million acres.

The 1947 crop was planted under extremely adverse conditions over most of the main soybean area. Plantings were delayed by the late wet spring with much of the acreage planted in late June and early July. Some of the increase in acreage over last

State	Acreage harvested*			Yield per acre			Production		
	Average 1936-45	1946	1947	Average 1936-45	1946	1947	Average 1936-45	1946	1947
	1,000 acres			Bushels			1,000 bushels		
New York	10	8	5	14.6	16.0	15.0	146	128	75
New Jersey	10	9	10	14.8	19.0	17.0	141	171	170
Pennsylvania	19	21	17	15.3	16.0	16.0	286	336	272
Ohio	688	903	950	19.2	18.0	18.5	13,423	16,254	17,575
Indiana	905	1,374	1,523	17.5	19.0	18.5	16,294	26,106	28,176
Illinois	2,420	3,320	3,622	20.6	23.5	18.0	50,239	78,020	65,196
Michigan	78	86	76	15.8	15.0	17.0	1,248	1,290	1,292
Wisconsin	28	33	26	14.3	12.5	13.0	410	412	338
Minnesota	142	610	920	14.4	17.5	15.0	2,025	10,675	13,890
Iowa	1,045	1,548	1,754	18.9	23.0	15.0	20,115	35,604	26,310
Missouri	290	718	825	12.8	20.0	12.0	4,194	14,360	9,900
North Dakota	75	6	6	10.8	11.0	10.0	757	66	60
South Dakota	10	19	50	13.8	14.5	11.5	136	276	575
Nebraska	22	23	32	13.7	21.0	14.5	304	483	464
Kansas	98	198	222	9.9	11.0	8.5	1,070	2,178	1,887
Delaware	28	33	42	12.6	15.5	13.0	355	512	546
Maryland	23	32	34	13.4	14.0	13.0	302	448	442
Virginia	60	67	95	13.8	16.5	15.0	832	1,106	1,425
West Virginia	1	1	1	12.4	13.5	14.0	14	14	14
North Carolina	196	212	261	11.4	13.5	15.0	2,219	2,862	3,915
South Carolina	10	16	17	6.9	10.0	10.0	72	160	160
Georgia	12	9	14	6.3	7.0	7.0	76	63	98
Kentucky	42	87	109	13.1	18.0	17.5	583	1,566	1,908
Tennessee	22	45	60	10.4	18.0	15.5	378	810	930
Alabama	18	30	41	7.9	16.0	18.0	161	480	738
Mississippi	69	70	95	10.4	15.0	14.0	806	1,050	1,330
Arkansas	133	295	283	12.8	18.5	12.0	1,787	5,458	3,396
Louisiana	24	27	24	12.6	13.0	12.5	305	351	300
Oklahoma	4	6	11	6.9	6.0	5.5	31	36	60
United States	6,418	9,806	11,125	18.2	20.5	16.3	117,886	201,275	181,362

\*Equivalent solid acreage. (Acreage grown alone, with an allowance for acreage grown with other crops). †Short-time average.

year was due to diversion of land intended for other spring crops which could not be planted because of the continued cold wet weather.

Drought during the growing season severely damaged the crop, especially in parts of Illinois, Wisconsin, and in the producing states west of the Mississippi River. Some fields had little or no rain from planting time to near maturity.

The maturing and harvesting period was

the one bright spot of the 1947 season. Frosts in late September in the northern areas did only slight damage and in some instances aided the crop by causing the leaves to fall and hastening maturity of the beans. Killing frosts, however, were later than usual over much of the soybean area. October weather was mostly favorable for harvesting the crop.

## Mostly Harvested

By December 1 only a small percentage of the crop remained to be harvested. A few fields were still unharvested in the northern areas but the highest percentage of beans yet to be harvested are in Virginia and North Carolina.

The North Central region yields were below both last year and average but even with the low yields more than 90 percent of the United States production was in this area. Ohio and Michigan had yields above 1946 although the crop was planted extremely late. However, the growing and harvesting season was better than further West. Indiana yields were nearly as high as in 1945 and were above average.

Illinois, the heaviest producing state, had the lowest yields since 1940. The state yield of 18 bushels per acre was 5½ bushels below last year and more than 2½ bushels per acre below the state 10-year average. The acreage in Illinois exceeded intentions because of a diversion of small grain and corn land to soybeans. Drought reduced yields but ideal weather hastened maturity



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and a high percentage of the total acreage was harvested for beans.

Of the major states, Iowa, Missouri and Arkansas suffered the most severe damage from dry weather. The yield in Iowa, at 15.0 bushels per acre, was the lowest since the drought year of 1936. The South Atlantic states had a relatively good season with the yields well above average but about the same as in 1946.

## WORLD REPORT

• One of a series of regularly scheduled reports on world agricultural production approved by the Office of Foreign Agricultural Relations committee on foreign crop and livestock statistics. For this report the committee was composed of C. M. Purves, acting chairman; Fred J. Rossiter, Regina H. Boyle, and Helen Francis.

World soybean production for 1947 is estimated at 490 million bushels, 4 percent less than a year ago, and the smallest out-turn since 1940, reports *Foreign Crops and Markets*. The decrease from last year is chiefly the result of lower yields per acre in the United States and Canada.

While official figures are not available for Manchuria, indications are that the crop is smaller than the 122.6 million bushels harvested in 1946. Increases, however, are reported for China, Korea, and the Netherlands Indies. According to recent information European soybean production is the largest in 3 years.

Canada's 1947 soybean harvest of .8 million bushels is the smallest since 1943. An early forecast indicated that 72,000 acres were being planted to this crop, but unfavorable weather during the growing season resulted in a much smaller harvest acreage. The present estimate is 49,000 acres, 17 percent below that of last year but the second largest for that country.

### Canadian Prices

The ceiling price for Nos. 1 and 2 Canada grade soybeans from the 1946 crop was increased from \$2.15 to \$2.40 per bushel, f.o.b. Toronto, and remained in effect until ceilings were removed on October 21, 1947. After that date soybean prices increased and by early November had reached \$3.25 per bushel.

The tentative Canadian goal for 1948 soybeans is 100,000 acres. Based on a 5-year (1943-47) average yield per acre, production should approach 2 million bushels. A crop even this size would be insufficient to meet

domestic requirements. Limited production has necessitated the importation of both soybeans and soybean oil of which the United States has been the source of supply. During the crop year ended July 31, imports of soybeans totaled 1.8 million bushels and oil 10.8 million pounds (equivalent to 1.2 million bushels of beans). At present, however, soybeans are on Canada's restricted import list.

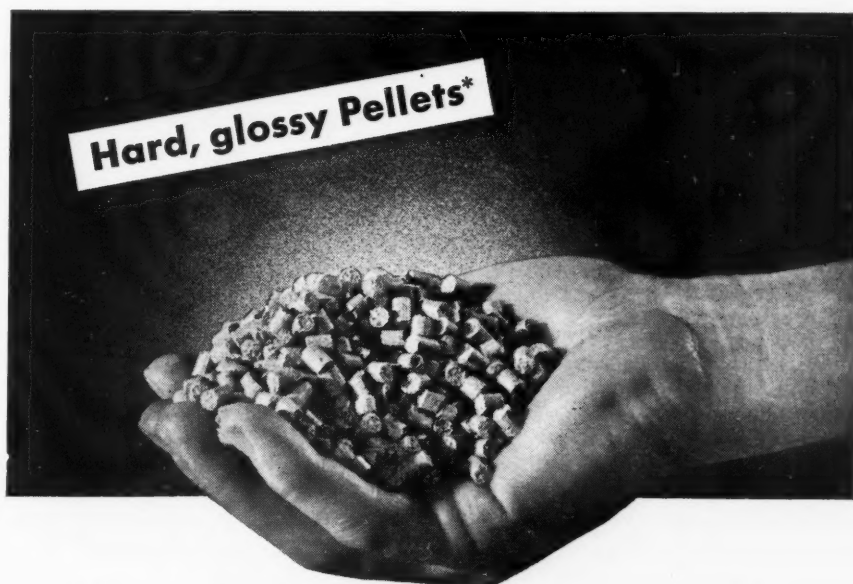
While complete official estimates for European soybean production are not available, indications are that most of the countries increased their 1947 acreages.

China's 1947 soybean crop is estimated at

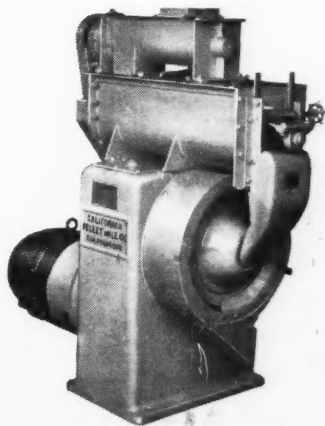
173.4 million bushels, 6 percent greater than that of last year and the largest since pre-war years (1935-39). The yield per acre, higher than in former years, is a result of favorable weather.

An estimate of the quantity of soybeans produced in Manchuria during the current season is not yet available. Production, however, is believed to be less than the 122.6 million bushels estimated for 1946 and considerably below the prewar average. Although crops have been smaller than average in the past few years, sizeable stocks of soybeans are reported to have accumu-

(Continued on page 26)



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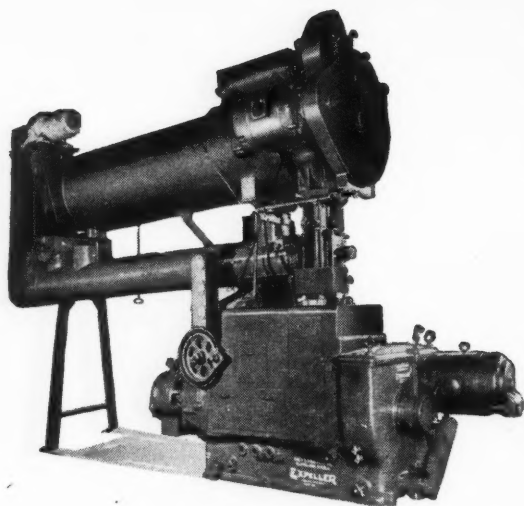
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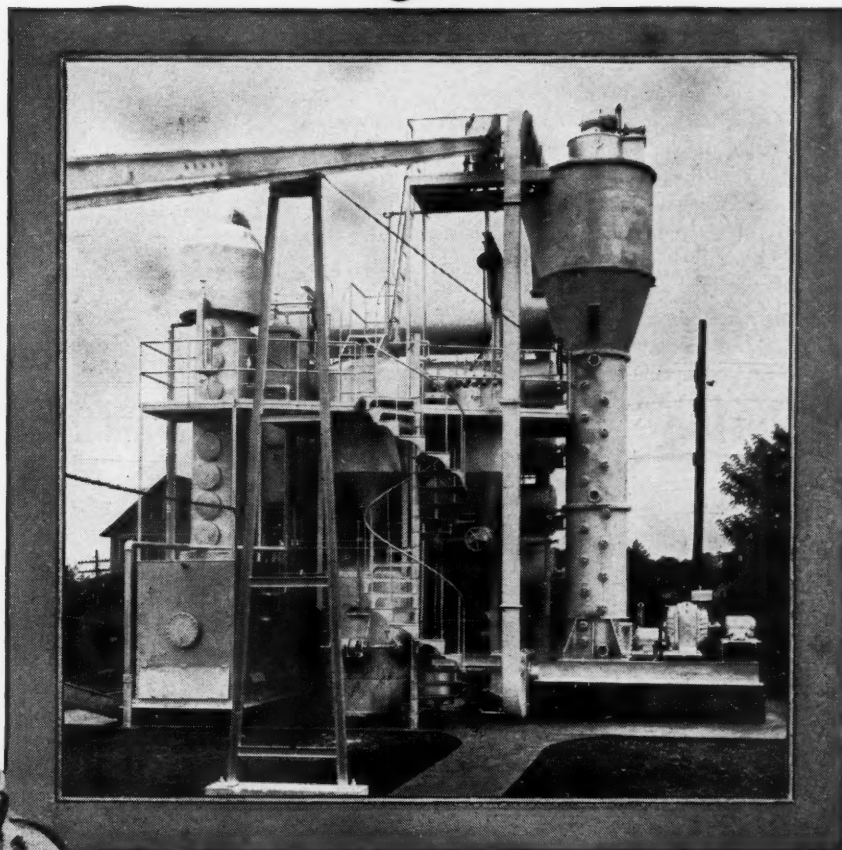
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## SOYBEAN CROP

(Continued from page 23)

lated. Normally about 78 percent of the output was exported in various forms, while out of the 1945 and 1946 crops only a small percentage left the country. Approximately a million bushels are reported to have been shipped to western Europe this year, and there is a steady movement by rail to the Soviet Union.

Soybean production in other countries of Asia is comparatively small. South Korea's 1947 output is approximately 11 million bushels, more than double last year's crop but 62 percent of the prewar average (total Korea). The Netherlands Indies reports 6.7 million bushels compared with 4.4 million last year and 2.2 million in 1945.

South American countries have shown a great deal of interest in growing soybeans but so far production has been small. Argentina, Brazil, Chile, Ecuador and Paraguay have reported, intermittently, estimates ranging from 2,000 to 100,000 bushels.

The Union of South Africa's Agricultural Department has conducted extensive research on the possibilities of soybean cultivation in that country. If production has passed the experimental stage, estimates are not included in official publications.

Australia appears eager to develop soybean production. The government is experimenting with numerous varieties of seed and planted 2,200 acres in 1946, but so far there is no indication of the yield. Queensland seems best suited to the production of this crop.

### Canadian Production

Canadian production of soybeans as reported by the Dominion Bureau of Statistics, with Ontario the only province reporting any acreage:

Acreage	
1946	1947
59,200	49,100
Yield per Acre (bu.)	
18.1	16.4
Production (bu.)	
1,072,000	806,000

## ALLIS-CHALMERS HAS COMPLETED 100 YEARS

Coinciding with the greatest period in U. S. industrial development, Allis-Chalmers in 1947 completed a 100-year record of engineering and manufacturing that has produced a most diversified line of major industrial products.

This giant producer of power generation, power distribution and power utilization equipment was conceived by Edward P. Allis, a native of Cazenovia, N. Y., who in 1861 acquired the 14-year-old French burr mill stone firm of Decker & Seville in Milwaukee.

It was while the company was under the direction of the late Gen. Otto H. Falk that it was decided to enter the agricultural equipment field. The first product was a tractor which appeared in 1914.

### Added Rubber Tires

Between 1928 and the present, Allis-Chalmers acquired eight companies to enable it to produce its present extensive line of tractors, farm and road machinery. All these companies poured new plant facilities, new talent, personnel, experience and products into the company's tractor division. They gave it a line of implements to meet almost every type of farming need.

Obvious as it seems now, the idea of putting rubber tires on a tractor was completely revolutionary in 1932 when first proposed by Allis-Chalmers engineers.

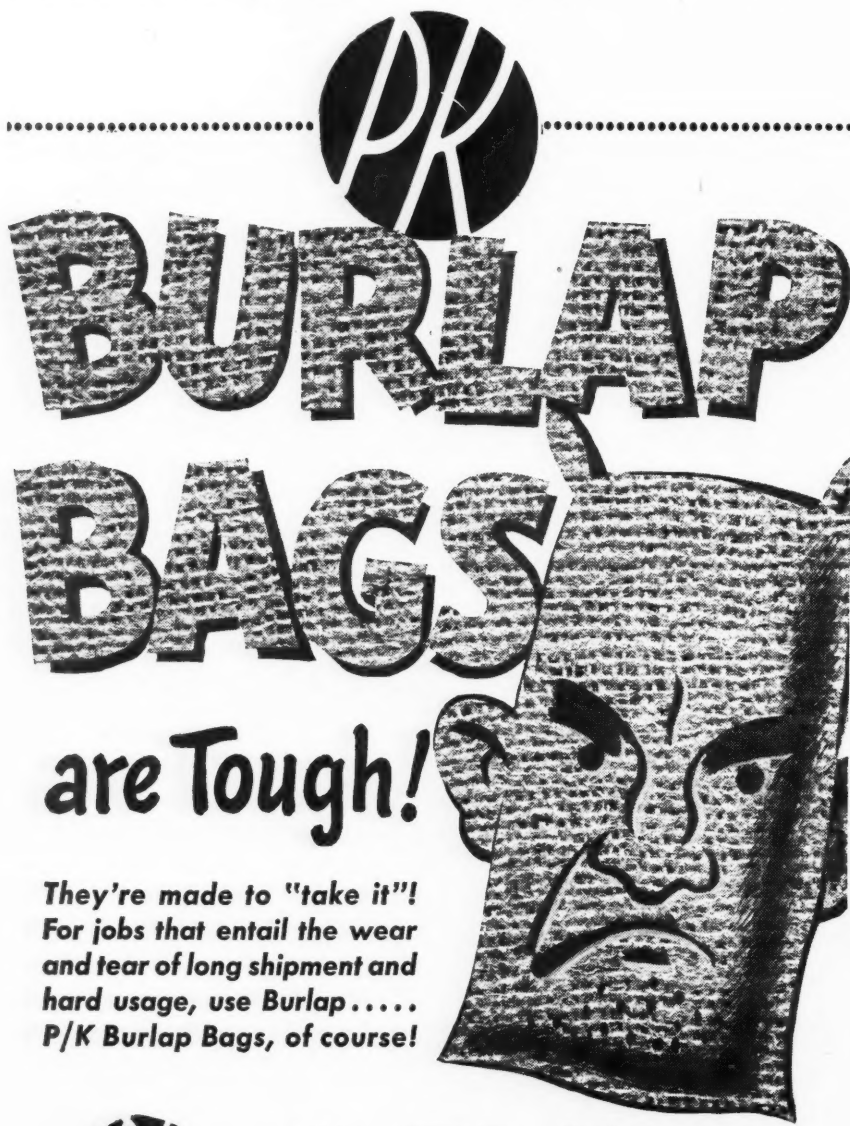
In 1937, the company's tractor division introduced its "Model B" tractor, which weighed less than a ton. It was the first tractor to capture a place on the small farm, and economically do the work of a team of horses.

### Solvent Extraction

For more than a decade, Allis-Chalmers has pioneered in the field of continuous solvent extraction of vegetable oils. During this time a wealth of engineering know-how and operating experience has been gained through the installation of numerous completely-equipped Allis-Chalmers systems.

In 1947, Allis-Chalmers placed in operation the world's first three plants for the continuous solvent extraction of cottonseed oil. All three installations are located in Arkansas and are rated at 200 tons per day of whole, clean cottonseed. The first of these went into operation at Wilson, Ark., for Delta Products Co. during March. In September, the Osceola Products Co., Osceola, Ark., commenced production. This plant is built to alternately process about 130 tons per 24 hours of soybeans. The third plant, that of Helena Cotton Oil Co., Helena, Ark., started up in October.

Arkansas' first plant for the continuous solvent extraction of soybean oil went on stream during July. It has a capacity of 75 tons per day of soybeans and is owned by Lee Wilson Co., Wilson, Ark.



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# "LIMITLESS POSSIBILITIES"

## Importance of Soy to the Feed Industry

By **BERNARD E. FRIEL**

Kansas Soya Products Co., Inc.  
From a talk before the Kansas Grain,  
Seed and Feed Dealers' Convention at  
Salina, Kans.

You are all familiar with the great expansion that has taken place in soybean production and processing and particularly how important to the feeding industry soybean products have become in recent years.

Today, soybean oil meal is the major source of high protein feed and has become practically the basic protein ingredient in formula feed manufacture.

There is good reason for the feed industry to rely so heavily on soybean oil meal. It is an excellent protein supplement for all classes of livestock and poultry. Experiments have shown that soybean oil meal furnishes nearly all of the supplemental protein necessary to a satisfactory and economical livestock production.

Animals build proteins in the body through amino acids. There are 22 of these amino acids—about half of which are nutritionally essential and must be present in the diet of the animal. Soybean oil meal furnishes all of these amino acids—although the level of methionine is low. Soybean oil meal, except for methionine, can be classed as a complete protein for feeding of livestock and poultry. The addition of about 4 percent animal protein, preferably fish meal or fish solubles, will correct this deficiency, making soybean oil meal the best balanced protein supplement.

### Yardstick Needed

To evaluate how our protein supply is meeting livestock needs, it is necessary to set up a "recommended" protein requirement for each class of livestock with which to compare the estimated actual quantity of protein fed.

The U.S.D.A. has recently issued a report on the present situation in which it has developed some figures showing the relation between the estimated needs of protein based on recommended standards of feeding and the available supplies.

The following report will be of interest to you. This report reveals the recommended level of digestible protein is about 11½ percent which would require approximately 15 million tons of digestible protein to be supplied in all concentrates (including grain, mill feeds, high proteins, etc.) compared to the need of about 13 million tons, thereby giving us a deficit of about 2 million tons of digestible protein per year. This digestible protein—if converted to high protein meals—would represent a total of about 6 million tons.

This report goes on to state that a considerable quantity of protein could be added

to the total feed by increased acreage and improvement of curing hay. It is estimated that about one-half of the protein deficit (3 million tons protein meal basis) could be recovered through increased and better hay production.

This, however, would still leave us a deficit of 3 million tons of protein—and on review of the various high protein feeds, we find that there is but little chance that we can expect any appreciable increase in any of these meals except from soybean oil meal. However, to obtain the required amount of protein from soybean oil meal would mean

that we would have to have about a 400 million bushel crop, or just double the soybean crop of the past several years.

It is up to us to encourage increased soybean acreage. There must be adequate supplies of protein meals to compound rations, which will produce more pounds of top quality products—at lower costs.

If each of us, in conjunction with agricultural colleges, extension services, and every other facility at our command—spread to the farmer and feeder, the nutritive value and the unlimited possibilities in soybean development, the ultimate goal of the feed industry to produce better products at lower costs will be attained and superior quality products manufactured to meet specific requirements will produce the life blood of our industry—good feeding, efficient management.

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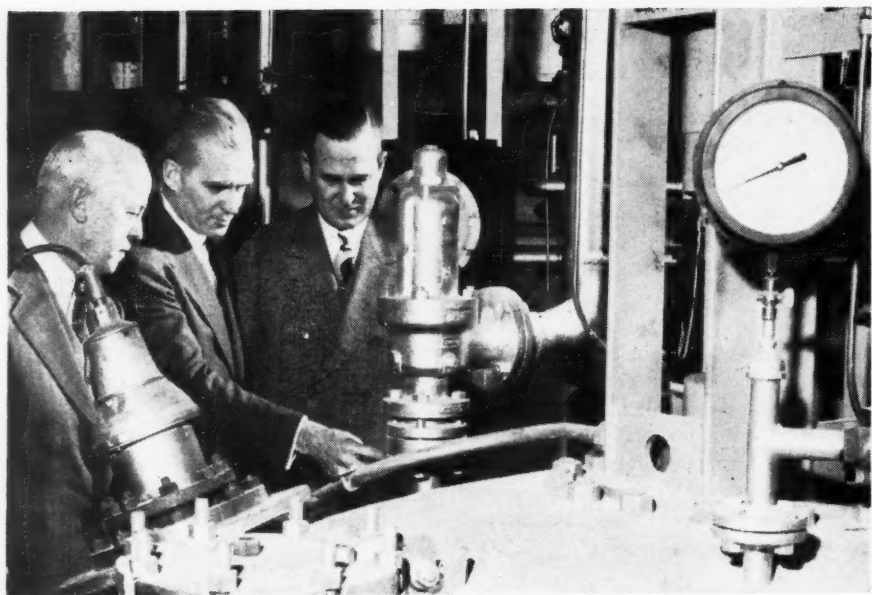
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Inspecting ADM's new vegetable oil processing plant are, left to right, Samuel O. Sorenson, vice president in charge of research, Walter G. Andrews, director of special oil sales, and ADM vice president J. W. Moore.

## NEW ADM PLANT IS OPENED

The world's largest vegetable oil processing plant, a \$1,250,000 installation devoted exclusively to processing oil bearing seeds, was placed in operation at Minneapolis January 2 by Archer-Daniels-Midland Co.

T. L. Daniels, ADM president, said the plant was designed to utilize war-developed chemicals, particularly those from the petroleum and synthetic rubber industries, in conjunction with linseed and soybean oils.

The unit, Mr. Daniels said, is part of a 7-million-dollar oil processing expansion program underway at Minneapolis as a further step "towards ADM's policy of creating new values from America's harvests."

Such products as crude rubber from plantations all over the world and chemicals produced from the petroleum and natural gas industries of the nation will be reacted and combined with products obtained from the farms of the upper Midwest, he said.

The construction program is a result of 10 years of collaborative research and development work by the Archer-Daniels-Midland Co. research and engineering departments. Another unit now under construction is designed to solvent extract the oil from flaxseed and soybeans by a new process recently patented by the ADM engineering department.

### Tailor-Made Oils

Other units in addition to the solvent extraction plant will separate the oil produced into its component parts of fatty acids and glycerine to obtain the basic ingredients from which can be produced tailor-made special oils for the paint, varnish, linoleum, cosmetic, pharmaceutical, printing ink, and a variety of major industries.

Improved products for Mr. and Mrs. John Q. Public will result from the new operation, it was explained. Special oils produced will

result in paints for interior and exterior application with faster drying time, better durability and increased water and alkali resistance. Longer life will be added to automobile brake linings. Stronger and more durable castings from which innumerable parts are machined in all types of metal working industries will result.

Other far-reaching effects will become more evident with the various chemical modifications of the basic ingredients obtained from vegetable oils, including linseed and soybean, Mr. Daniels said.

With operations of the new plant, Archer-Daniels-Midland Co. becomes not only the nation's largest processor of flax seed, but also the largest producer of vegetable oils, it is claimed.

### Steady Employment

"A great deal of the research and development work of the Archer-Daniels-Midland Co. has been directed toward diversifying and eliminating seasonal employment from our linseed and soybean crushing operations," Daniels explained.

"To do this, the logical step was to carry further the processing of the vegetable oils produced and use them as the basic raw materials for processing into specification products for numerous industries.

Linseed and soybean oil meal, remaining from the seed after extraction of oil, will continue to be used in the manufacture of Archer Quality Feeds for poultry and livestock because of its high protein content.

— s b d —

### HUNGARIAN BEAN CROP

Hungary's 1947 soybean crop is estimated at 88,000 bushels from approximately 8,000 acres, compared with 55,000 bushels from 5,400 acres in 1946, reports USDA's *Foreign Crops and Markets*. Although this crop represents a 60 percent increase over last year's, it is considerably smaller than the prewar output of 125,000 bushels and less than half the 194,000 record output of 1940.

Soybeans are used chiefly for domestic oil production, and no surplus is available for export.

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## NOTED CHEMIST DIES SUDDENLY

Many friends in the industry will be pained to learn of the death of Dr. Bruno Rewald in Minneapolis October 3, report of which belatedly reached the *Soybean Digest*.

Dr. Rewald, who was a chemist, was actively interested in soybeans in three countries, Germany where he was born, and the United States and England.

He became interested in soybeans in the early 20th century in Germany, when he helped to purify extracted soybean oil. One of the impurities was lecithin, which has become one of the most valuable byproducts of the soybean industry. From that time on he made lecithin and phosphatides his life work. He had a hand in all the industrial uses to which lecithin is put—margarine, chocolate, leather and as an emulsifier in general.

Dr. Rewald became interested in soybeans in general, and made himself familiar with their growth and cultivation. At that time all soybeans came to Germany from Manchuria. Efforts to cultivate them in the Balkans met with little success.

In 1928 he first came to America on a coast-to-coast lecture tour trying to interest Americans in the soybean, then relatively unknown by the public. During the trip he made many contacts in the U. S.

In 1933 Dr. Rewald made his permanent home in England and helped to establish the first lecithin factory there during the war. He came to this country for a short visit in 1946 and again in 1947.

Death in Minneapolis was due to heart attack, while on a trip in the interest of the industry. He was 65 years old. He is survived by a wife and three sons.

—s b d—

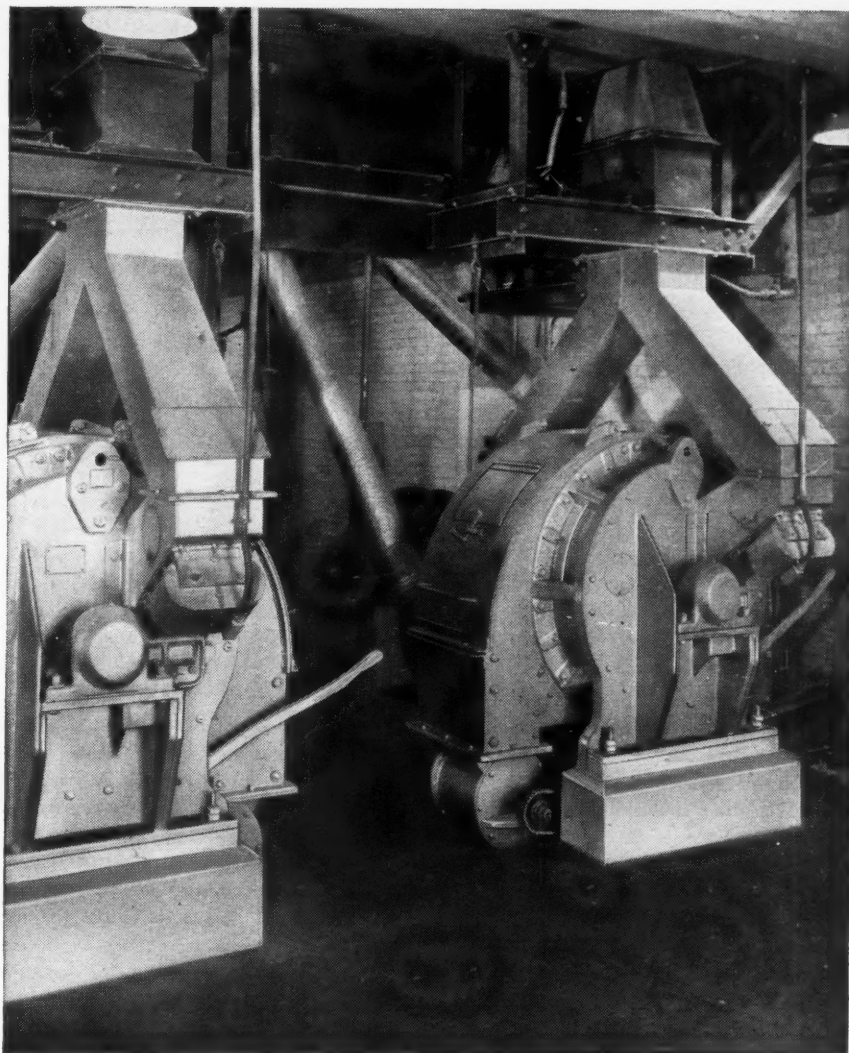
## PILLSBURY EXPANSION

Pillsbury Mills, Inc., Minneapolis, has broken ground for an expansion of its research laboratory and construction of a pilot plant to be used in testing new manufacturing methods.

Dr. Frank L. Gunderson, research and products development vice president, Stanley Partridge, a director of the company, C. G. Harrel and Warren H. Goss, associate directors of research and products development, participated in the brief formal ceremonies.

The pilot plant will house an installation of small scale processing equipment in widely flexible arrangements and of new designs. The installation will be used to test new processes, to solve most of the manufacturing problems in advance of large scale production and to determine costs and product yields. In addition, Dr. Gunderson said, the pilot plant will provide quantities of new products adequate for test market evaluation.

Construction of the two projects is expected to cost not more than \$150,000. The building will be completed about July 1.



## Keeping Step

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## PRATER PULVERIZERS





# Publications

## Feeding

**SOYBEAN OIL-FILLED MILKS FOR FEEDING YOUNG DAIRY CALVES.** N. L. Jacobson and C. Y. Cannon, Iowa State College. In *Journal of Dairy Science*, August 1947.

Observations were made of the growth and general health of young dairy calves fed various reconstituted milks as compared to whole milk. The calves were fed at the rate of 10 lbs. of milk per 100 lbs. liveweight. All calves were placed on the experimental ration for 8 weeks, beginning at the age of 3 days. Daily supplements of vitamins A and D and a mineral mixture were given to all calves. All calves were muzzled and received no hay or grain.

One group of experimental animals was fed whole milk containing approximately 3 percent butterfat. Another group was fed a reconstituted skim milk made by mixing one part of dried skim milk with nine parts of water.

Five other groups were fed reconstituted skim milk plus various oils as follows: (a) butter oil, 3 percent; (b) expeller process soybean oil, 2 percent; (c) expeller process soybean oil, 3 percent; (d) expeller process soybean oil, 3 percent, plus a vitamin supplement including thiamine, riboflavin, calcium pantothenate, pyridoxine, nicotinamide, ascorbic acid, and alpha tocopherol; and (e) hydrogenated soybean oil, 3 percent.

The group receiving 2 percent soybean oil exceeded the skim milk group in growth, but calves in the soybean oil group scoured frequently. The calves receiving 3 percent expeller soybean oil scoured badly and were very unthrifty. Three animals in this group died. Supplementation of the milk containing 3 percent expeller oil with the vitamins neither improved the growth of the calves nor reduced the incidence of scours.

The calves in the group fed 3 percent hydrogenated soybean oil grew well and were in excellent condition at the end of the experimental period. There were no significant differences in growth or general appearance between the group fed butter oil and the group which received hydrogenated soybean oil. The calves of both of these groups compared favorably with those fed whole milk.

**THE INFLUENCE OF CRACKED SOYBEANS AND SOYBEAN HAY ON THE FLAVOR AND QUALITY OF MILK.** By Erle E. Bartley and C. Y. Cannon, Iowa State College. *Journal of Dairy Science*, August 1947.

The dairy industry long has been troubled with the development of undesirable flavors in milk. Since soybeans are the chief source of homegrown protein in Iowa, some of these flavors were attributed to the feeding of soybeans on the assumption that soybeans increase the proportion of unsaturated fatty acids in butterfat and thereby would increase the susceptibility of milk to the development of oxidized flavor.

Tests were made to determine the flavor effect on milk when cows were fed four different rations, two containing soybean hay and two alfalfa hay. The two grain mixtures fed were similar, except that one contained cracked soybeans and the other linseed meal. The rations were assigned to the cows within each group and between groups at random according to a latin square design so that each cow was fed each of the four rations in succeeding periods of 5 weeks each. The milk was collected in glass, well-tinned and rusted tinned containers.

Neither soybeans nor soybean hay as such seemed to affect adversely the flavor of milk; in fact, the milk scores were slightly higher when soybean hay was fed than when alfalfa

hay was the ration. This difference probably was due to a difference in quality of hay rather than to the variety.

Contrary to results in a previous trial, the rusted tinned containers adversely affected the flavor of the milk regardless of whether the milk was produced from animals fed soybeans or not. This result was not unexpected, for the exposed iron in the rusted tinned containers easily could act as a catalyst accelerating the oxidation of the fat.

**A CHICK GROWTH FACTOR IN COW MANURE. V. RELATION TO QUANTITY AND QUALITY OF SOYBEAN OIL MEAL IN THE DIET.** By Max Rubin and H. R. Bird, U. S. Department of Agriculture Research Center, Beltsville, Md. *Journal of Nutrition*, Aug. 11, 1947.

It has been reported that an all-plant protein diet containing 35 percent of commercially heated soybean oil meal produced suboptimal growth of chickens unless supplemented with fish meal, cow manure or extracts of cow manure.

Soybean oil meal fed to young chicks as 70 percent of the diet caused an inhibition of growth and increased mortality. Both of these effects were counteracted by the addition of the growth factor of cow manure to the diet but not by the addition of methionine.

The growth factor of cow manure improved the nutritional value of a chick diet containing raw soybean oil meal as the only protein concentrate, but not to the extent that it improved a diet containing heated soybean oil meal.

Evidence has been presented that soybean oil meal at high levels exerts an inhibiting effect on the growth of chicks which is not due to a heat-labile trypsin inhibitor, and which is not nullified by heating or by enzymatic digestion, but which is counteracted by the chick growth factor of cow manure.

**ROLE OF INHIBITORS IN SOYBEAN.** By H. S. R. Desichar and S. S. De, department of biochemistry, Indian Institute of Science, Bangalore. *Science*, Oct. 31, 1947.

It is now recognized that cooking or auto-

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claving increases the nutritive value of the protein of soybeans. The general opinion is that cooking increases the availability of cystine and methionine.

But later experiments have led to the conclusion that the higher biological value of autoclaved soybeans is due to an increased rate of release of methionine rather than a higher degree of its availability.

The present investigation was undertaken to see whether the presence of proteolytic inhibitor would affect the nutritive value of soybean protein digested with enzyme so that the amino acids are in free form.

From the results it is evident that the role of the proteolytic inhibitor in deciding the nutritive value of raw soybeans is not in diminishing the degree of availability or rate of release of methionine.

It can be postulated that apart from the inhibitor there is a separate factor which affects the nutritive value of the soybean protein. Further work on the isolation of this factor and the respective roles of these inhibitors in the nutritive value of soybeans is in progress.

**SULFUR DISTRIBUTIONS, WITH SPECIAL REFERENCE TO THE CYSTINE PLUS CYSTEINE AND METHIONINE CONTENTS, OF THE SEEDS AND SEED PROTEINS OF TWO VARIETIES OF SOYBEANS.** By R. Johanson and J. W. H. Lugg, Department of Biochemistry, University of Melbourne. *Australian Journal of Experimental Biology and Medical Science.*

Numerous estimates have been made of the contents of the sulfur-containing amino acids, cystine and methionine, in soybean seeds and their mixed proteins. There is considerable discordance between the results of even the more serious studies.

This study was meant as a critical examination of the sulfur distribution of soybeans, including varietal differences. Lincoln and Dunfield varieties grown at Armidale, New South Wales, were used.

The cystine and methionine content of the "whole" proteins were very similar for the two varieties.

In terms of nitrogen present, the seeds and "whole" proteins were of moderate cystine content and of rather low methionine content. In this respect soybean seeds do not deviate seriously from the general pattern of legume seeds, contrary to earlier information.

### Flame Cultivation

**FLAME CULTIVATION IN THE MISSISSIPPI HILL AREA.** By T. N. Jones and R. F. Dudley. *Mississippi Farm Research*, Oct. 1947. State College, Miss.

Flame cultivation became an integral part of mechanized crop production in the Mississippi Delta sections in 1945.

The agricultural engineering department of the Mississippi Experiment Station inaugurated a program in the spring of 1947

to determine whether or not the equipment as used in the Delta could also be used successfully in the hills.

Cotton, corn, sorghum, grain sorghum and soybeans were successfully flamed during the past season. Those working with the problem were able to use the flaming equipment on contour, on slopes up to 12 or 13 percent, which is greater than is recommended for row crops on certain soil types.

The flaming operation was always in conjunction with cultivation, which permits one man doing the two operations simultaneously.

Flame cultivation is not an operation to take the place of all hoeing. However, it is an operation which fits into mechanical production of row crops and will undoubtedly reduce hoeing requirements to a great extent. Jones and Dudley believe that the equipment on the market at the present time can be successfully used in the hill section where good farming practices are followed.

—s b d—

### GABBY

(Continued from page 19)

the field of foods, a great deal of work has been done which will eventually lead to new uses for soybean oil in the field of industry. This group of laboratory people have added small bits of knowledge to the ever-growing accumulation of facts in this field and have particularly concerned themselves with some

of the minor constituents of what we usually think of as soybean oil.

From sterols, one of the minor constituents of soybean oil, they have been able to produce on a commercial scale some of the sex hormones which duplicate the material naturally manufactured only in the animal body. While the actual quantities of materials like these which can be consumed by the people of the world are fairly small, they represent the processing of a tremendous quantity of soybeans. The sterols from which these hormones are made constitute in the neighborhood of 0.2 percent of the soybean oil. When one considers that the sterols must go through many steps in the chemical procedure to a given hormone it is easy to see that the amount of hormone produced is relatively small even on the basis of the sterols from which they are made. This means that a great deal of soybean oil must be processed in order to obtain the starting material for even a small amount of the finished product.

It is developments like these which will make the soybean industry grow in size and make it possible for America to utilize all of the soybeans which can be produced in our country. To the many other accomplishments of the soybean may now be added a successful experiment in human relations and real democracy which will, as time goes on, bear fruits toward a better place for all to live.



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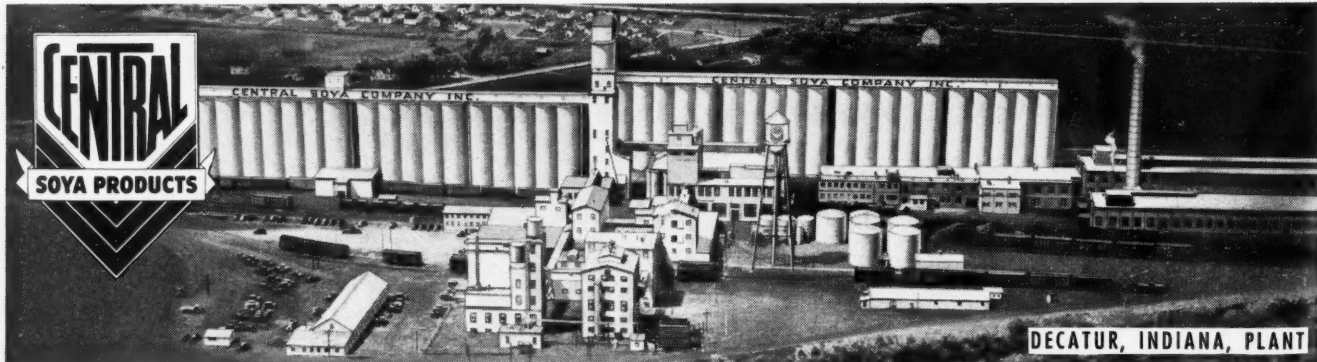
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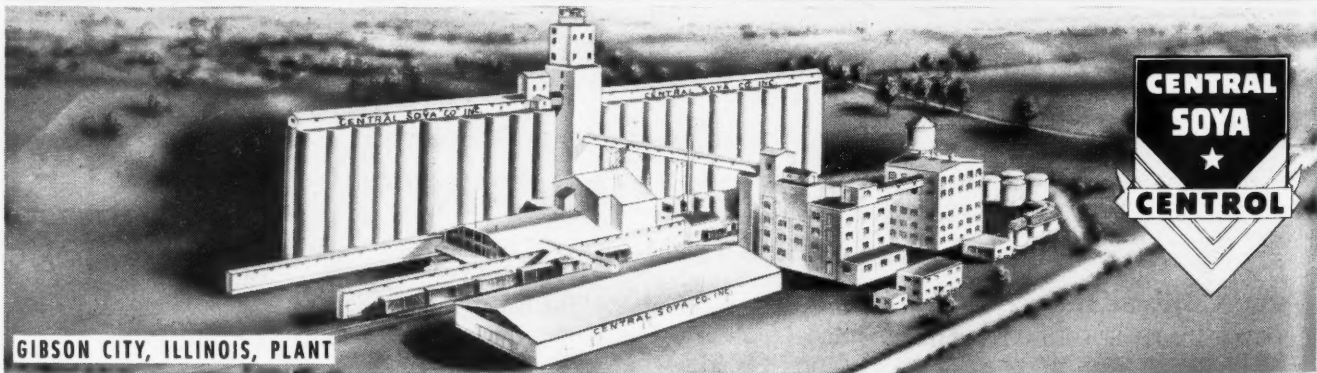
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JANUARY, 1948



# GRITS and FLAKES...

FROM THE WORLD OF SOY

Blaw-Knox Co., Pittsburgh, has issued Bulletin No. 2087 entitled *Resin Plants and Equipment*, a 24-page pamphlet to describe and illustrate a variety of plants and equipment for the resin industry and allied fields.

\* \* \* \*

W. A. Carlson, Minneapolis, and Leo J. Walsh, New York, have been appointed vice presidents of the special commodities division of General Mills, Inc. Carlson will serve as operations control executive and Walsh will supervise all sales activities.

\* \* \* \*

Leonard C. Heinlein has been appointed to the newly created position of assistant superintendent at the Link-Belt Co.'s ball and roller bearing division plant in Indianapolis. He has been at the Indianapolis plant since 1926.

\* \* \* \*

Columbus Basile has been appointed superintendent of the Link-Belt Co.'s Caldwell plant at 2410 W. 18th St., Chicago. The Caldwell plant manufactures materials handling and power transmission equipment.

\* \* \* \*

Gerald Wilson, industrial engineer, has been appointed district contract manager for the eastern district by the H. K. Ferguson Co., industrial engineers and builders of Cleveland, New York and Houston. Wilson has been representative for Ford, Bacon and Davis of New York since 1939.

\* \* \* \*

T. N. Barksdale, until recently in charge of Bemis Bro. Bag Co.'s Baltimore sales office, has assumed new sales responsibilities at the Bemis Memphis sales division. This office covers all of Tennessee and Mississippi and portions of five other states.

\* \* \* \*

Milquo Limited has changed its firm name to Vi-Tone Products Limited, 198 Gage Ave. S., Hamilton, Ont. Ray H. Bissell is president.

\* \* \* \*

Recent speaker before the Northwest Paint and Varnish Production Club of Minneapolis was A. G. Hovey of the chemical division of General Mills, Inc. His subject was soybean oil in coatings.

\* \* \* \*

The Bemis Bro. Bag Co. Christmas greeting card featured a color etching of the wind-driven flour mills of Montmartre near Paris. These mills date back to the 14th century at least. Bemis has been using mill scenes on Christmas cards for 17 years.

\* \* \* \*

An appeal for technical papers to be presented at the 39th annual meeting of the American Oil Chemists' Society in New Orleans May 4-6 is being made by K. S. Markley, program chairman. Deadline for abstracts is March 1.

\* \* \* \*

"A Study of Caustic Refining of Vegetable Oils," was title of an article by Ralph F. Fash in December *Journal of the American Oil Chemists' Society*.

\* \* \* \*

A new, 48-page, copiously illustrated *Bulk-Flo Book No. 2175* has been issued on Bulk-Flo conveyors by Link-Belt Co. A copy may be obtained from Link-Belt Co., 2410 W. 18th St., Chicago 8, Ill.

\* \* \* \*

Dr. S. E. Tray is now manager of the Allis-Chalmers chemical processing machinery section, announces G. V. Woody, manager of the firm's basic industry's department. Dr. Tray joined Allis-Chalmers 15 years ago, has been assistant manager of the basic industries department.

\* \* \* \*

The Mississippi Federation of Business and Professional Women's Clubs has adopted a resolution for a vigorous program to "repeal ALL legislation which singles out margarine for special taxation."

\* \* \* \*

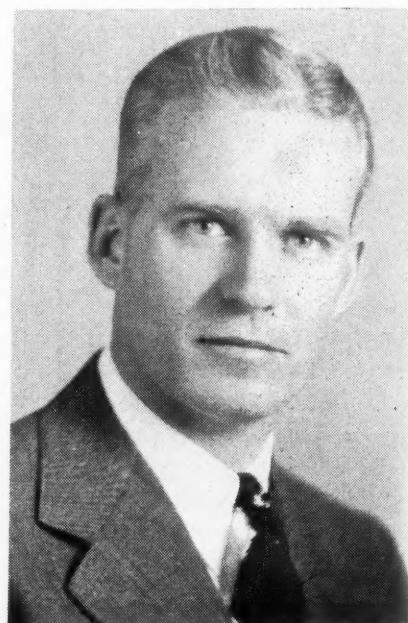
Harry A. Bullis, president of General Mills, Inc., was named chairman of the board of directors to succeed James F. Bell, effective January 1. Leslie N. Perrin, executive vice president, was elected president.

\* \* \* \*

A new 12-page bulletin describing Wolf milling equipment is now available from the Wolf Co., Chambersburg, Penn. The new Wolf compartment purifier and Wolf sifters are illustrated and described.

\* \* \* \*

Marvin E. Narramore, formerly with Spencer Kellogg & Sons, Inc., has been named



W. G. ANDREWS

## A-D-M APPOINTMENT

Appointment of Walter G. Andrews, St. Paul, as director of special oil sales was announced by J. W. Moore, vice president of Archer-Daniels-Midland Co.

Andrews was graduated from Carleton College School of Chemistry in 1935 and spent three years at University of Pittsburgh in graduate work in chemical engineering. He was a fellow at the Mellon Institute of Industrial Research from 1935 to 1940.

He joined ADM's research division in 1941 and was appointed to the oil sales division in 1945.

- s b d -

## NEW ST. LOUIS FIRM

A new firm, Hammermills, Inc., located at 1021 Big Bend Blvd., St. Louis, Mo., is announced. The firm will manufacture a complete line of hammermills and feed mills for crushing, pulverizing and shredding.

Charles M. Bindner, the president, has a background of 30 years in the hammermill business. He was one of the original organizers of Dixie Machinery Manufacturing Co. and became president of that firm in 1940. On September 18 he sold his interest to E. W. Noxon.

Bindner has been responsible for many designs and improvements in hammermills, having developed the V-belt fan and the double drive fan for hammermills.

T. A. Oberhellmann, vice president and chief engineer, has had 25 years' experience in designing hammermills. He was formerly chief engineer of the Dixie Machinery firm. He has also had many years' experience in

designing hammermills for feed plants and allied industries.

"This combined experience will be of vital interest to feed plant operators, to say nothing of the latest designed hammermill which we offer," the firm announces. "This new hammermill is a revolutionary design that will control gradation of ground material to a fine degree, being the only equipment made which will grind day in and day out the same finished product regardless of moisture in grain. It will give a granular or fine ground corn by small adjustment. Many features have been added such as air control, no perforated screens and less hammerwear."

Plant location will be announced at an early date.

— s b d —



GEORGE H. KYSER

#### G-M PROMOTION

Whitney H. Eastman, vice president of General Mills, Inc., Minneapolis, and president of the chemical division, announces the promotion of George H. Kyser from chief chemist to technical director of the Belmond, Iowa, plant. Mr. Kyser has served as chief chemist for the past 3 years.

Wilbur L. Taylor, formerly technical director, has been made technical advisor and continues at the Minneapolis office.

Mr. Eastman also announces the promotion of Guy LaLone, Jr. to supervisor of the Belmond Refineries. Mr. LaLone has been serving as a technical trainee under E. E. Woolley, plant superintendent at the Belmond plant.

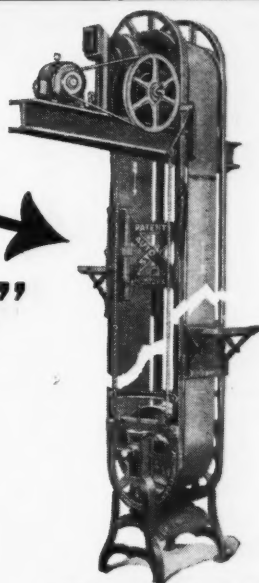
— s b d —

#### CHEMURGIC MEETING

"Chemurgy in Action" will be the theme of the national conference of the National Farm Chemurgic Council to be held at Hotel Fontenelle, Omaha, Nebraska, March 3-6.

Topics tentatively chosen for addresses

**GET A LIFT**



### "Hop on a Humphrey"

#### REDUCE EMPLOYEE FATIGUE

Stair-climbing causes delays — irritates employees — eats up profits. It's so much more efficient to "hop on the Humphrey" — always on the move, up one side, down the other.

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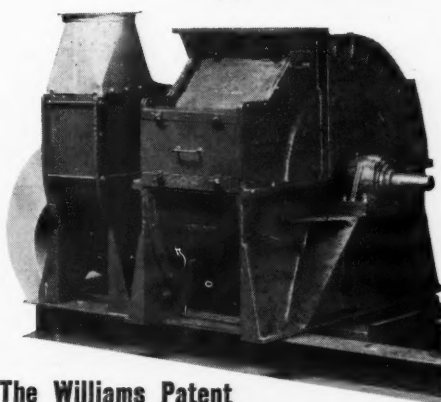
#### HUMPHREY ELEVATOR COMPANY

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**WILLIAMS**  
PATENT CRUSHERS GRINDERS SHREDDERS

managing director of the Feed Institute of Iowa, Des Moines. He succeeds O. N. LaFollette, now supervisor of feed and seed inspectors for the Iowa Department of Agriculture.

\* \* \* \*

Albert Ernest has joined the Florida Pulp & Paper Co., wholly owned subsidiary of St. Regis Paper Co., in an executive capacity. He will be in charge of land acquisition and timber production along the Atlantic seaboard.

\* \* \* \*

With election year in the offing, Bemis Bro. Bag Co. is again distributing its presidential elections folder, a record of electoral votes by state and party since 1860. A copy may be obtained from the nearest Bemis office.

\* \* \* \*

Eastern Iowa Milling Co., New Hampton, Iowa, has completed work on its new soybean processing plant. G. A. Ward and M. V. Clark are owners.

\* \* \* \*

"Economic Factors in the Growth of the Oilseed Industry in the United States," is title of a doctor's thesis by Allen B. Paul in department of agricultural economics at the University of Illinois, Urbana, Ill. Soybeans, cottonseed, flax, peanuts and other oilseeds are covered.

\* \* \* \*

Ben Gee Products, Inc., Oak Park, Ill., is featuring a meatless chop suey dinner as an economical, tasty and easy-to-serve meal. The dinner is a complete meal for four persons and includes tea and soy sauce.

\* \* \* \*

The Memphis branch of Allis-Chalmers tractor division was officially opened in December. The new plant has 60,000 square feet.

\* \* \* \*

Harry Burros, Burros Bag Co., Brooklyn, has been elected president of the Greater New York chapter of the National Burlap Bag Association.

\* \* \* \*

"Soybeans Are Here to Stay," is an article by Jeannette B. McCay, chairman of the soybean committee of the New York State Emergency Food Commission during the war, in the December issue of *Journal of Home Economics*.

\* \* \* \*

R. Dolenshek has been appointed to represent the Val-A Co. of Chicago in southeastern Wisconsin, the company announces. He has had 4 years experience in retail feed sales and specializes in poultry service work.

\* \* \* \*

A line of improved totally-enclosed, fan-cooled wound-rotor motors has been announced by the Allis-Chalmers Mfg. Co., Milwaukee, Wis. The improved motors are suited for all fields of industry.

\* \* \* \*

The Glidden Co. has contracted with Blaw-Knox Co., Pittsburgh, Pa., for modernizing its Cleveland plant. Blaw-Knox will supply and install new resin production equipment, design a new structure to house it and provide engineering for remodeling present structures. The amount of the contract is about \$100,000.

and panel discussion include: "Research for New Uses and New Crops," "A Chemurgic Foundation for World Peace," "Hidden Wealth of the Continent," "New Chemurgic By-Products from the Soil," and "The Future of Soybeans." Speakers will include distinguished leaders of science, industry, and agriculture.

— s b d —

## TO WASHINGTON

A. J. Loveland, Iowa PMA chairman, was named head of agricultural conservation programs branch of Production and Marketing Administration in December. Loveland, who has been in AAA and PMA work, from the township level on up, for 11 years, will thus go to Washington to head what is left of the original AAA program.

Loveland owns—and operated until the AAA work took him away from home—a 176-acre farm at the edge of Janesville, in Bremer County, Iowa.

Hogs and dairying are main activities of the farm. Loveland grows soybeans also.

A. J. LOVELAND



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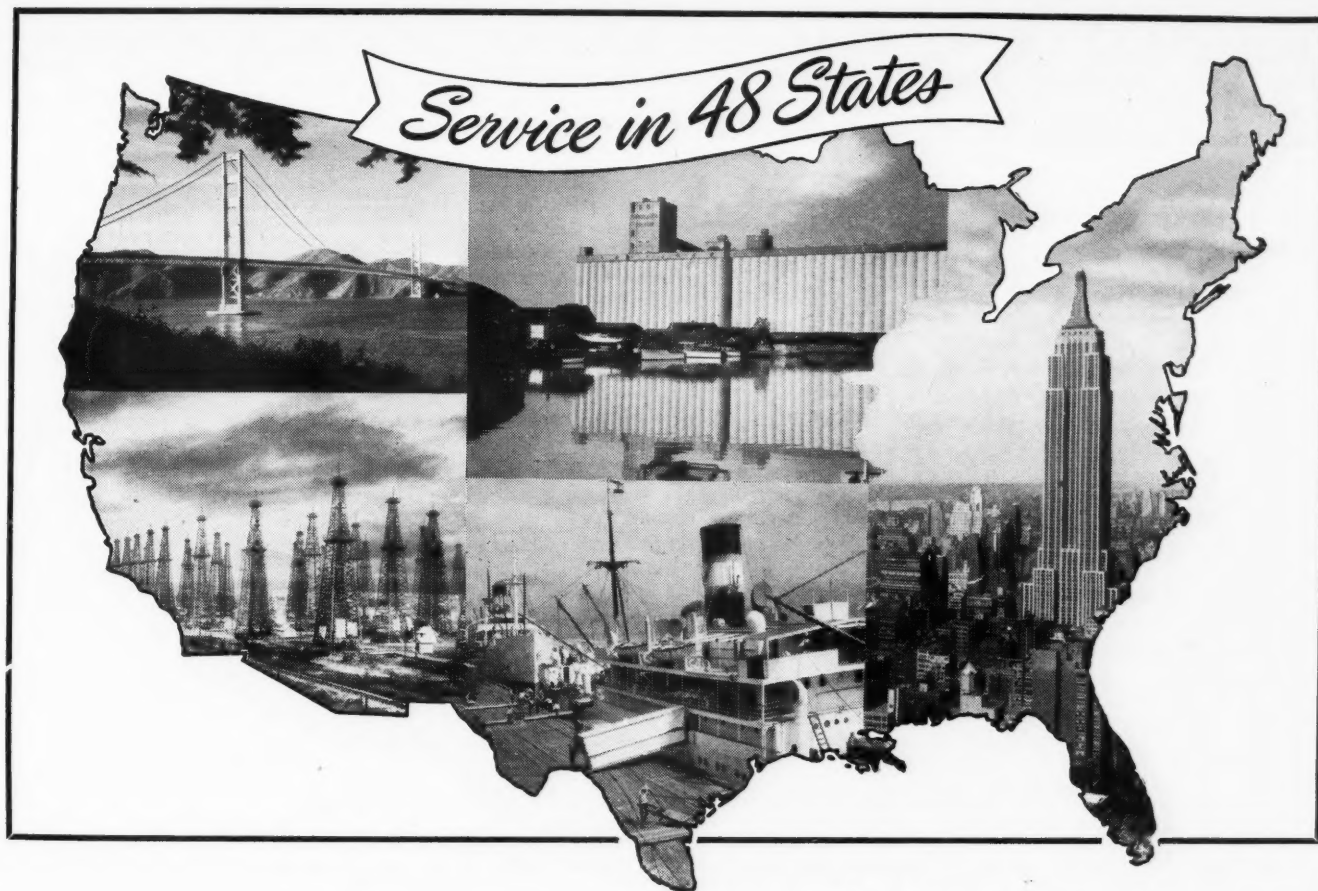
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## Advisory Committee

The soybean and flaxseed advisory committee under the Research and Marketing Act has advised Secretary Anderson that research is needed to solve production problems still confronting producers, in spite of the recognized value of work already done.

Meeting with Department of Agriculture officials recently (Dec. 18 and 19), the industry committee recommended projects for breeding industrially valuable varieties of soybeans adapted to the South and extension of such work in the North-Central states. They also asked that research on the toxic effects of insecticides, fungicides and herbicides on plants and animals be broadened to include soybeans.

On the industrial side, the committee recommended continuation and expansion of work started this year on stabilizing the flavor of soybean oil and investigation of the possibilities of mixing soybean flour with wheat flour in bread.

The committee urged that next year's program on marketing research and service include development of new methods for quick and accurate determination of the quantity and quality of oil in oilseeds; analysis of factors that affect production, prices and uses of fats, oils and oilseeds, and speeding up of studies of improving marketing facilities, equipment, and methods of farm storage of oilseeds, especially soybeans. A soybean variety survey was recommended to get information of aid to handlers and processors in obtaining the varieties they need and to help growers in marketing their soybeans according to market demand and quality.

Attending were D. J. Bunnell, chairman, Central Soya Co., Inc., Chicago; Otto G. Brandau, soybean grower, Rudd, Iowa; R. W. Capps, vice president, Archer-Daniels-Midland Co., Minneapolis; H. E. Carpenter, president, Lexington Soy Products Co., Lex-

ington, Ohio; J. B. Edmondson, soybean grower, Clayton, Ind.; Eugene D. Funk, Jr.; president, Funk Bros. Seed Co., Bloomington, Ill.; Lloyd Mehlhouse, flaxseed grower, Olivia, Minn.; Karl Nolin, grower-processor, Ralston, Iowa; Edwin Traynor, flaxseed grower, Starkweather, N. D.; Harry Truax, manager, soybean department, Indiana Farm Bureau Cooperative Association, Indianapolis, Ind.

## Marshall Plan

By far the greater part of the fats and oils and of oilcake and meal needed for the 16 European countries under the Marshall Plan would come from other countries in the Western Hemisphere, rather than from the United States.

Estimates which the President sent to Congress as the special session closed showed that during the life of the program (to mid-1952), the U. S. might be expected to be called upon for 767,000 short tons of fats and oils and 1,153,000 short tons of oilcake and meal. But from other Western Hemisphere countries, the U. S. experts expect, would come 1,489,000 tons of oils and fats and 6,114,000 tons of oilcake and meal.

In dollars (at July 1, 1947 prices) this would be \$383,200,000 worth of oils and fats and \$94,400,000 worth of oilcake and meal from the U. S., against \$969,200,000 worth of oils and fats and \$637,900,000 worth of oilcake and meal from other Western Hemisphere countries.

No breakdown as to kinds of fats and oils or oilcakes was shown.

Annual quantities required from the United States in these estimates, on a fiscal year basis after the initial April-to-June, 1948, period, are shown in the following table in thousands of short tons and millions of dollars.

By PORTER M. HEDGE

Washington Correspondent for  
The Soybean Digest

	Apr.-June 1948	1918- 1919	1949- 1950	1950- 1951	1951- 1952
Fats & Oils	19.6	160.9	176.4	195.1	195.1
Value	20.0	80.4	88.0	97.4	97.4
Oilcake & Meal	52.9	218.3	275.8	275.8	330.7
Value	4.4	17.7	22.6	22.6	27.1

Before the war, Europe as a whole imported 3.7 million short tons annually of fats, oils and oilseeds (as oil). Only about half of this is now being received.

## Margarine Battle

The oleo vs. butter battle will open up in Congress again in the coming regular session. It won't get the headlines that the Marshall Plan debate will, but the Marshall Plan—and high prices—will help to give oleo a far better show of winning than it's usually had.

A good many observers here think there's significance in the fact that bills to repeal the oleo tax this time have been introduced by two northern Congressmen—Buck of New York with H.R. 4470 and Mitchell of Indiana with H.R. 4681. Both Buck and Mitchell are Republicans. Heretofore, bills to repeal the oleo tax have come chiefly from southerners interested in cottonseed, have been opposed chiefly by dairy region congressmen.

This doesn't say the tax will go in this attempt, but new groups are joining more strongly on the side of untaxed oleo. And dairy farmers seem to have less stake in butter prices.

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C. C. FARRINGTON

## Farrington Leaves USDA

Long known to many in the soybean business — from grower to the top of the industry—Carl C. Farrington stepped out of the Department of Agriculture into private industry December 27.

Farrington, who will join Archer-Daniels-Midland at Minneapolis, has been vice president of the Commodity Credit Corp. and assistant administrator of the Production

and Marketing Administration in USDA since 1939. Before that, from 1934, he was in the Department's Agricultural Adjustment Administration. An Oklahoman, from Anadarko, he first went to work for Agriculture in the Bureau of Agricultural Economics in 1928.

"Not a very nice Christmas present," wryly said Secretary Anderson, accepting Farrington's resignation with regret that "the Department can't give its career people a future that more nearly expresses present day living costs."

Farrington heads the grain department of Archer-Daniels-Midland Co. He began his new duties in Minneapolis January 5.

Farrington succeeded Joshua M. Chilton, 59, a vice president and director of ADM, who died in Minneapolis Dec. 7. Mr. Chilton, a nationally recognized authority on marketing and warehousing grain, was in charge of the grain department and had been associated with the firm for 15 years.

## Pelleted vs. Soft Feeds

An unanswered question in poultry feeding is how pelleted mash compares with soft mash. So the Feed Advisory Committee under the Research and Marketing Act has recommended a comparative study be made, for poultry as well as for other livestock.

Only experiments so far have been on a small scale. Poultrymen at the USDA's Beltsville station say the pellets vs. mash question is one of those most frequently asked them. While the study proposed is to be devoted mainly to the pellets vs. mash question, closely tied in with this will be tests of effect of color, tastiness and appearance on feed consumption. Rate of gain and feed consumption will be checked.

Practically all manufacturers are now making some chicken feed in pellet form.

## Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.  
Minimum insertion \$1.00.

**SITUATIONS VACANT** — Two fully qualified and experienced chemical engineers required, each to run one shift of a 150 tons a day Allis-Chalmers solvent extraction plant on soya beans in England, commencing first September 1948. Previous experience in solvent plant essential. Excellent salary. Write full details, to FS, care Soybean Digest, Hudson, Iowa.



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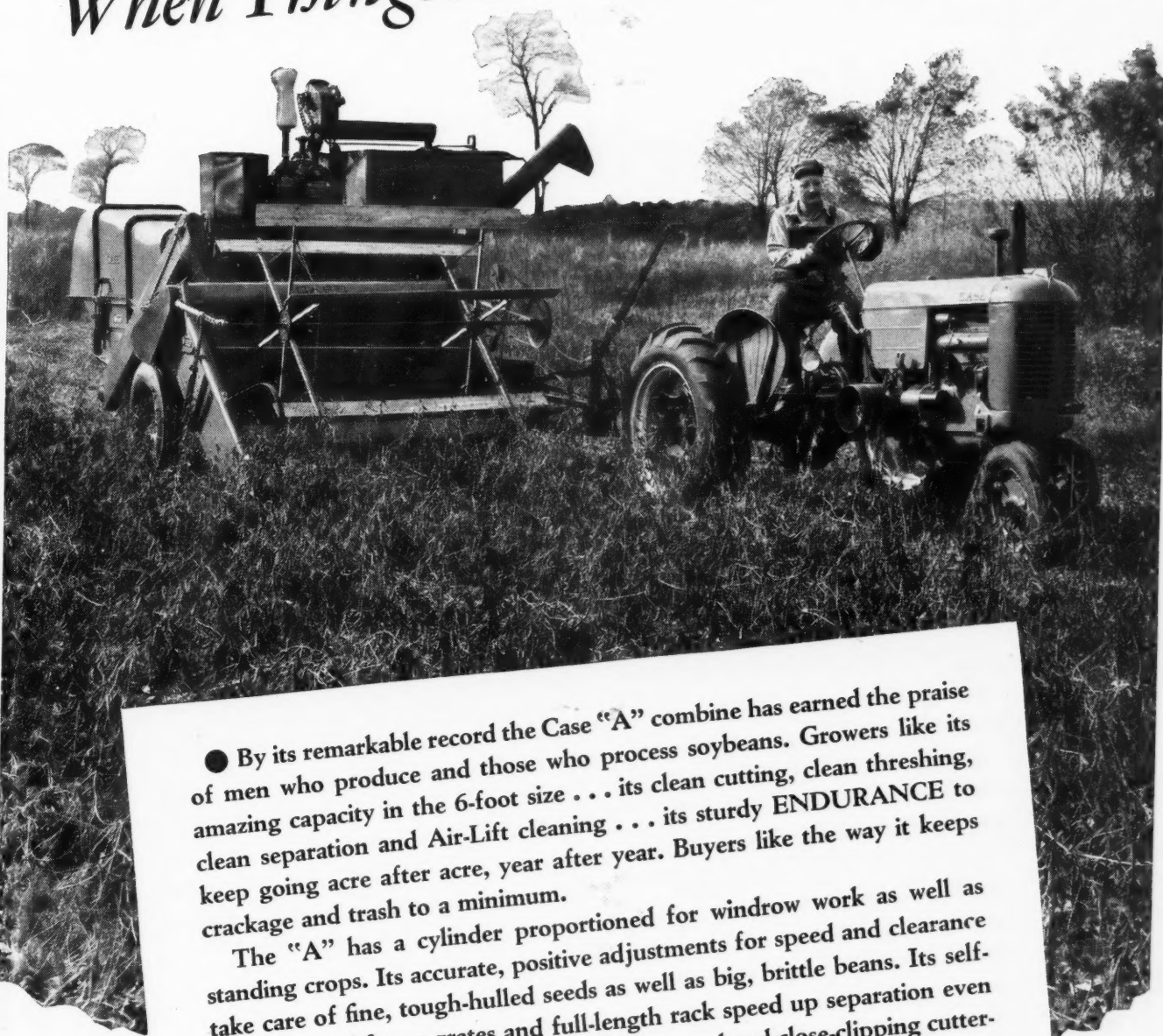
*Analytical Chemists*

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**"WITHOUT Curves  
Would I Be  
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We wouldn't know about that, lady. We do know, however, that it's a *curve*, a **Logarithmic Curve** to be specific, that put the **Calumet Cup** at the top of the elevator bucket popularity list. Because of its

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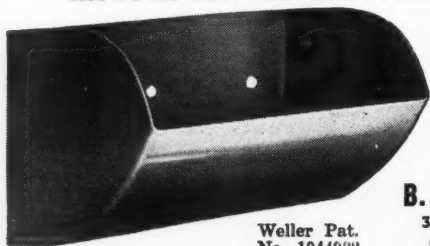
**CALUMET SUPER CAPACITY ELEVATOR CUP**

can be spaced closer on belt. Speed of belt can be increased or decreased over a wide range with satisfactory results and it can be operated efficiently over any sized pulley. It scoops up **super** capacity loads in elevator boot and discharges **super** capacity loads from outlet spout **without** backlegging.

To quote an elevator operator who replaced old style buckets with the modern streamlined Calumet: "You said it **when** you said **It's The Curve That Counts** . . . for the Calumet Cup has

what it takes to substantially increase capacity and speed up operation."

**ASK YOUR JOBBER**  
Or write for capacity data sheet.



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## In The MARKETS

### MARKETS ARE STEADY DURING DECEMBER

After showing some weakness the fore part of the month, soybeans and bean products strengthened and held their own during the balance of December.

Soybeans and soybean oil closed the month at about the same level as a month earlier, while oil meal worked \$6 higher. The spread in all three markets was small compared to November and October.

Cash No. 2 soybeans hung between \$3.85 and \$4 for the month. March futures for No. 2 soybeans at Chicago opened at \$3.95 Dec. 1. The month's low was \$3.81 Dec. 8, and the trend was generally up for the balance of the month with a high of \$4 Dec. 20-22 and \$4.04 Dec. 31.

Soybeans were weakened early in the month by weakness in February forward soybean oil meal. A strengthening factor later was rumors of large export shipments of soybean oil meal.

The futures market was fairly active until holiday time.

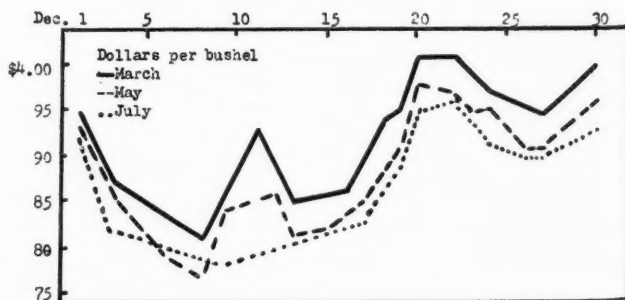
Spot bulk soybean oil meal, Decatur basis opened the month at \$90. The low was reached 2 days later at \$88.50. A stronger trend followed and the market closed at \$97 Dec. 30. There was a good demand for immediate shipment most of the month with supplies scarce.

USDA announced that protein feeds and mixed feeds will be subject to emergency allocations during the first half of 1948, a continuation of current policy.

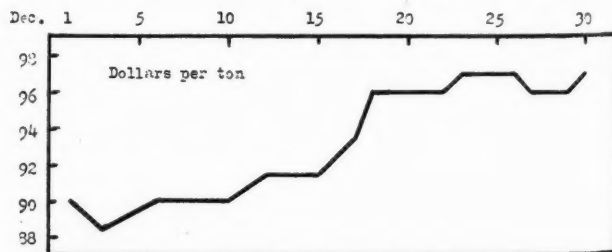
Announcement of reduced export allocations of fats and oils the first quarter of 1948 had a weakening effect on the soybean oil market early in December. Crude soybean oil, tankers, f.o.b. Decatur, opened the month at \$28.50. The low was \$25 Dec. 15, and the Dec. 30 close was \$27.

Markets were quiet at holiday time.

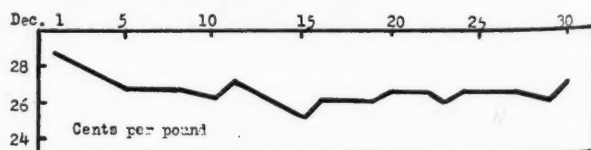
No. 2 SOYBEANS, CHICAGO FUTURES



SPOT BULK SOYBEAN OIL MEAL, DECATUR BASIS



CRUDE SOYBEAN OIL, TANKERS, F.O.B. DECATUR



SOYBEAN DIGEST



● **FEED SUPPLIES.** Supplies of byproduct feeds for the 1946-47 season were 9 percent above the 1945-46 season and only slightly below the record, the Department of Agriculture reports in *Feed Market Summary*. Record production of wheat millfeeds, rice millfeeds, gluten feed and meal, soybean oil meal and copra meal more than offset a drop in the output of linseed meal and alfalfa meal. Despite smaller livestock numbers, demand for feed was excellent and feedstuffs prices last season averaged about 25 percent above the previous season and more than double the prewar (1935-39) average.

Supplies of oilseed cakes and meals for feed during the 1946-47 season were slightly above the 1945-46 season but 6 percent below the record for 1944-45. Production of soybean and copra meal was at a record high but the output of linseed and cottonseed meal was lower than in recent years.

Exports of soybean and peanut meals were large, with exports of oilseed meals October through September totalling 182,200 tons as against only negligible exports during the war years. Supplies of oilseed meals for feed for the 1946-47 season totalled 5,827,700 tons compared with 5,802,700 tons for 1945-46 and 6,206,000 tons for 1944-45. A sharp increase in the output of cottonseed and copra meal resulted in larger supplies of oilseed meals in the July-September quarter this year over the same months last year.

With record crushings of soybeans, supplies of soybean cake and oil meal amounted to 3,742,800 tons last season compared with 3,655,000 tons the previous high. Because of the increase in crushings in the last quarter, supplies of cottonseed meal were slightly larger than in the previous season and totalled 1,434,900 tons. This is more than 500,000 tons below the 10-year (1936-45) average.

The supply of linseed cake and meal last season totalled 371,700 tons, the smallest since 1938-39 when over half of the production was exported. This compares with 563,300 tons available for 1945-46 and 519,300 tons the 10-year average. Peanut cake and meal supplies for domestic use totalled 88,400 tons last season, an increase of 5,700 tons over the previous season. Imports of copra and coconut were large with the result that copra meal supplies were at record high, amounting to 189,900 tons for 1946-47 against only 69,100 tons available for 1945-46.

Based on November 1 estimates of grain and oilseed production, the supply of byproduct feeds and oilseed meals for the 1947-48 season will be 600,000 to 700,000 tons short of last year's supply of 16 million tons. Supplies of oilseed meals are expected to be around 100,000 tons larger than last season, while grain byproduct feeds will fall about 800,000 tons short of last season.

Principal increases are expected in the output of linseed and cottonseed meal, while the production of gluten feed and meal, distillers' dried grains, soybean oil meal and wheat millfeeds from present indications will be smaller.

Supplies of byproduct feeds and oilseed meal for 1947-48 amount to 225 pounds per livestock unit based on estimated livestock numbers on farms January 1, 1948. This compares with 232 pounds available for the 1946-47 season, 195 pounds the average for the war years (1941-45) and 167 pounds the prewar average.

● **IMPORTS UP, EXPORTS DOWN.** United States imports of principal vegetable oils and oilseeds (in terms of oil) totaled 1,095 million pounds during January-October, 71 percent larger than in the same months of 1946, but still smaller than in prewar years.

Copra (as oil) arrivals were more than double those of last year and exceeded the 1935-39 average (12 months) by a sizeable margin. In prewar years, however, the United States imported larger quantities of coconut oil than copra. Babassu kernels, babassu oil, and flaxseed registered declines compared with the corresponding 10 months of 1946.

January-October exports of the more important fats and oils (in terms of oil) amounted to 545.9 million pounds as against 586.0 million in the corresponding months of last year, and 241.1 million during 1935-39. Lard shipments were down more than a million pounds.

# Margarine Sales

## AT A NEW HIGH LEVEL

★ ★ ★

The popularity of margarine is constantly increasing. Sales have now reached an all-time high. Production was estimated at nearly 700 million pounds in 1947—more than one-fifth greater than the previous year, and more than double the 1939 to 1941 average.

Margarine is the second largest user of soybean oils. And the increasing popularity of margarine is more reason than ever to give this basic food your support.

The Margarine Association is continuing to build public demand for margarine by reminding Americans of its goodness and its economy with full-color pages appearing regularly in *Life* magazine. This is in addition to the advertising being run by the individual brands.

Watch for these ads—and pass along the good word about margarine.

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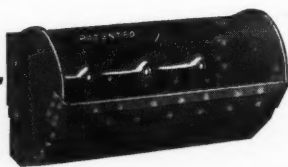
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● **SOYBEAN EXPORTS.** U. S. soybean exports during January-September 1947 totaled 1,142,000 bushels, reports USDA's *Foreign Crops and Markets*.

This compares with 944,000 bu. for the same period in 1946, and 4,793,000 bu. for the 1935-39 average.

Refined soybean oil exported during January-September 1947 totaled 25,394,000 lbs., compared with 55,468,000 lbs. for the same period in 1946, and 6,467,000 lbs. for the 1935-39 average.

Crude oil exported during January-September totaled 38,865,000 lbs., compared with 6,496,000 lbs. for the same period last year; and 13,228,000 lbs. for the full 1946 period.

● **SOYBEAN GLUE IN PLYWOOD.** Soybean glue consumed by the softwood plywood industry in October totaled 2,063,000 lbs., reports Bureau of the Census. This compares with 2,117,000 lbs. in September and 2,559,000 lbs. in October 1946.

Other glue used by the plywood industry in October in pounds: casein, 604,000; phenolic resin, 4,009,000; other, 300,000. Total glue consumed was 6,976,000 lbs.

Production of softwood plywood during October 1947 was the highest in the past 6 years. October production is estimated at 170,325,000 square feet, a 16 percent increase over that for September (146,985,000 square feet). Production increases were shown by more than 90 percent of the reporting mills.

October 1947 production exceeded that for October 1946 by about 14 percent. Total production for the first 10 months of 1947 amounted to approximately 1,398,018,000 square feet, 18 percent more than for the corresponding period in 1946.

Shipments and consumption of softwood plywood during October 1947 were the highest since April 1942. Although 5 percent less than the October record production, October shipments and consumption exceeded September by 10 percent.

Soybean glue stocks totaled 1,329,000 lbs. Total glue stocks at the end of October were 3,854,000 lbs.

● **SOYBEAN GLUE IN PLYWOOD.** Soybean glue consumed by the softwood plywood industry in September totaled 2,027,000 lbs. compared with 1,824,000 lbs. in August, reports Bureau of the Census. Consumption in September 1946 was 2,287,000 lbs.

● **SOYBEAN INSPECTIONS.** Inspected receipts of soybeans dropped sharply in November to a total of 12,285 cars compared with 30,830 cars in October, according to reports to the Department of Agriculture. November inspections brought the total for the first two months of the season to 43,115 cars compared with 48,978 cars for the same months in 1946 and 54,271 cars in 1945. The average for the month of November for the crop years 1941-45 was 15,845 cars.

The quality of the soybeans inspected in November was lower than for the preceding month, only 82 percent grading No. 2 or better compared with 92 percent in October. October-November receipts graded considerably higher than those of last season, but somewhat below the exceptionally good 1945 crop. Eighty-nine percent graded No. 2 or better for October-November this season compared with 73 percent last season and 93 percent in 1945.

● **FACTORY CONSUMPTION OF SOYBEAN OIL.** Factory consumption of crude soybean oil totaled 311,167,000 lbs. during the third quarter of 1947, reports J. C. Capt, director of the Bureau of the Census.

Of the above amount, 296,673,000 lbs. were used in refining. Other uses: (Lbs.) fat splitting, 708,000; sulphonation 146,000; soap 653,000; paint and varnish 1,621,000; lubricants 77,000; other 11,288,000.

Factory consumption of refined soybean oil during the third quarter totaled 290,906,000 lbs. Uses included: (Lbs.) sulphonation 188,000; winterized for salad oil (whole oil used) 33,734,000; shortening 150,873,000; margarine 52,611,000; other edible 17,385,000; soap 312,000; paint and varnish 20,597,000; linoleum and oilcloth 5,825,000; lubricants and greases 39,000; other inedible 9,146,000.



● **STANDARD SHORTENING SHIPMENTS.** Reported by members of Institute of Shortening Mfrs., in pounds.

November 29 .....	8,982,684
December 6 .....	7,495,906
December 13 .....	5,542,617
December 20 .....	4,278,146
December 27 .....	2,515,933

Grand total shortening and edible oil shipments by quarters, 1947, in pounds.

1st Quarter .....	718,486,000
2nd Quarter .....	464,953,000
3rd Quarter .....	659,926,000
October .....	288,222,000
November .....	272,354,000

● **COMMERCIAL SOYBEAN STOCKS.** Production and Marketing Administration's commercial grain stock reports for December.

	Dec. 1	Dec. 8	Dec. 15	Dec. 22
Atlantic Coast .....	513	477	395	480
Gulf Coast .....	63	63	63	63
Northwestern and				
Upper Lake .....	2,238	2,266	2,220	2,060
Lower Lake .....	5,132	5,394	3,537	5,493
East Central .....	3,480	3,449	3,291	3,625
West Central				
Southwestern and Western ..	3,240	3,195	3,351	3,048
Pacific Coast .....	0	0	0	
Total current week .....	14,666	14,844	12,857	14,769
Total year ago .....	24,029	23,481	23,010	20,948



## Government Orders

● **FATS AND OILS EXPORT ALLOCATIONS.** The U. S. Department of Agriculture has announced smaller first quarter 1948 export allocations of fats and oils than for the same period of 1947, but officials stated that actual shipments during the period will include quantities carried over from fourth quarter 1947 allocations.

Allocations announced for January-March 1948 total 87.0 million pounds. This consists of 63.8 million pounds of fats and oils for commercial shipment and 23.2 million pounds of shelled peanuts on an oil content basis to be supplied by the Commodity Credit Corporation. For the first quarter of 1947 the export allocations (excluding exchanges and unshipped balances which had been reallocated) totaled 145.8 million pounds.

The January-March 1948 commercial allocations include (in fat content) 34.5 million pounds of lard, 2.2 million pounds of margarine, 12.7 million pounds of shortening and other edible oils, 0.3 million pounds of drying oils, 8.1 million pounds of other inedible fats and oils, and 6.0 million pounds of soap.



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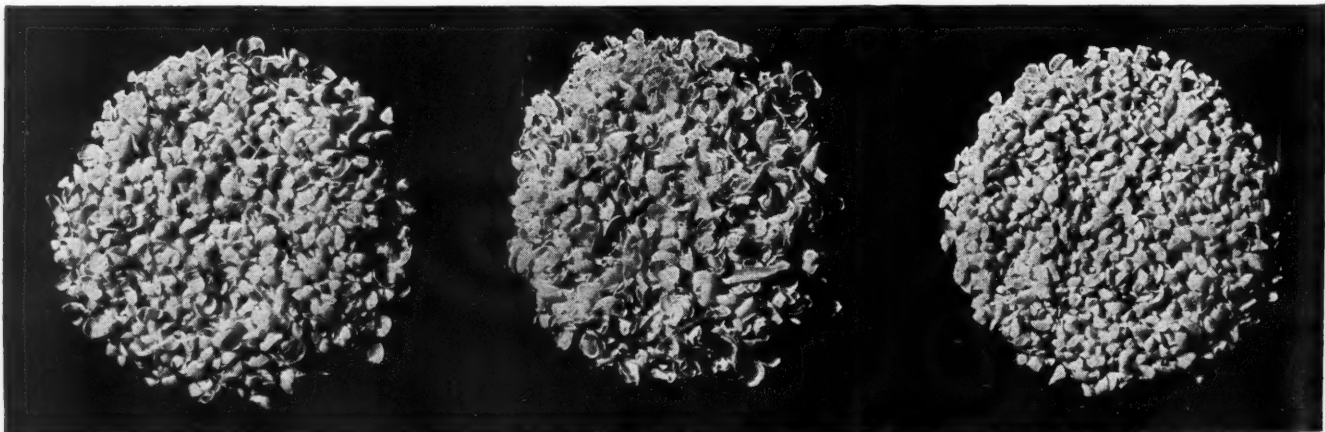
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Photo No. 1 shows cracked soybeans before hull removal. Photo No. 2, the hulls, etc., removed. Photo No. 3, the cracked soybeans after hull removal.

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